



**CiViTAS**  
Cleaner and better transport in cities

**ARCHIMEDES**

AALBORG • BRIGHTON & HOVE • DONOSTIA - SAN SEBASTIÁN • IAȘI • MONZA • ÚSTÍ NAD LABEM

**IASI**

**T76.1 Bus Management System in  
IASI**

IASI

May 2012



THE CIVITAS INITIATIVE  
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# Contents

- 1. INTRODUCTION..... 4**
  - 1.1 BACKGROUND CIVITAS ..... 4
  - 1.2 BACKGROUND ARCHIMEDES ..... 5
  - 1.3 PARTICIPANT CITIES ..... 5
    - 1.3.1 *Leading City Innovation Areas*..... 5
- 2. IASI ..... 5**
- 3. BACKGROUND TO THE DELIVERABLE ..... 6**
  - 3.1 SUMMARY DESCRIPTION OF THE TASKS ..... 6
- 4. BUS MANAGEMENT SYSTEM IN IASI..... 7**
  - 4.1 DESCRIPTION OF THE WORK DONE ..... 7
  - 4.2 MAIN OUTCOMES ..... 12
  - 4.3 COMMUNICATION ACTIVITIES ..... 12
  - 4.4 PROBLEMS IDENTIFIED ..... 15
  - 4.5 FUTURE PLANS ..... 15

# 1. Introduction

## 1.1 Background CIVITAS

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

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

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

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

### Objectives:

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

### Horizontal projects support the CIVITAS demonstration projects & cities by :

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

### Key elements of CIVITAS

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

## 1.2 Background ARCHIMEDES

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

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

## 1.3 Participant Cities

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

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

### 1.3.1 Leading City Innovation Areas

The four Leading cities in the ARCHIMEDES project are:

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

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

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

## 2. Iasi

The City of Iasi is located in north-eastern Romania and is the second largest Romanian city, after Bucharest, with a population of 366,000 inhabitants. It is also the centre of a metropolitan

area, which occupies a surface of 787.87 square kilometres, encompassing a total population of 398,000 inhabitants.

The city seeks to develop possibilities for habitation, recreation and relaxation for all citizens in the region, business opportunities and provide opportunities for more consistent investments.

The city has five universities with approximately 50,000 students, 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 are 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, served by the PT service number “8” (Complex Tudor Vladimirescu - Copou) with an approximate length of 10 km. The City of Iasi will implement its integrated measures in this area to be known as the “CIVITAS+Corridor”.

The city's objectives in CIVITAS - ARCHIMEDES are based on the existing plans related to transport, Local Agenda 21, approved in 2002, and the Sustainable Social-Economic Development Strategy for City of Iasi. The CIVITAS Plus objectives were integrated in the Integrated Urban Development Plan development which was finalized in October 2009.

## 3. Background to the Deliverable

Before the implementation of this measure, there was no integrated traffic management.

The main objective of measure 76 is to build a common platform for integrated monitoring and passenger information services. The system makes it possible to monitor and plan PT services. In addition, it increases the level of information offered to users of these services. Improving PT services through the implementation of these systems will lead to:

- a change in the perception of users and consequently to an increase in the number of users
- reduced waiting times in stations
- a reduction in the number of incidents involving PT vehicles.

### 3.1 Summary Description of the Tasks

The measure comprises 3 tasks: T8.11.1 - Global Positioning System (GPS) Monitoring System, T8.11.2 - Maintenance Facility Centre and T8.11.3 - Modules for Management of Incidents and Specific Equipment.

- Task 8.11.1 GPS Monitoring System: each vehicle is equipped with GPS satellite positioning module, GSM module for communication with the main control centre, antennas and accessories.
- Task 8.11.2 Maintenance Facility Centre: each centre is equipped with management, recording and storage systems. The connection between local networks and all the embedded vehicle video surveillance systems is assured through wireless devices (access points, routers, and switches).
- Task 8.11.3 Modules for Management of Incidents and Specific Equipment: the Incident Management Module is integrated with the toll free telephone line (0 800 110 427) and it manages all existing and new events occurring during the operations of the Traffic Management System.



## 4. Bus Management System in Iasi

### 4.1 Description of the work done

#### GPS Monitoring System and Maintenance Facility Centre

For a better organization of the PT fleet, Iasi City Hall together with the Public Transport Company of Iasi (RATP) have decided to implement a monitoring system where 36 trams and 64 buses are controlled through GPS modules leading to an optimized transport schedule. Based on this theory, a public procurement tender was organized. The winning company implemented the SafeFleet system composed of:

1. SafeFleet X700 equipment – GPS hardware equipment with General Packet Radio Service (GPRS) modem, installed on each vehicle. The system reads information like location, speed and then with the help of GPS receiver that has 20 channels, calculates vehicle kilometres. The system has a (Global System for Mobile communications) (GSM) antenna, USB, RS-232 serial, CAN and 1-Wire ports. Information received from X700 equipment (position, speed, events, alarms, etc.) are managed by the SafeFleet Portal software application to allow the client to view data in real time and to generate different reports and statistics.
2. Fuel flow meter – Hall sensor flow meter to control fuel flow.
3. SafeFleet Portal software application – stand alone software application which offers a interface for tracking PT vehicles 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 Smartphone.

SafeFleet Portal software application uses the latest vector maps (see Figure. 1) that cover both national and international territory.

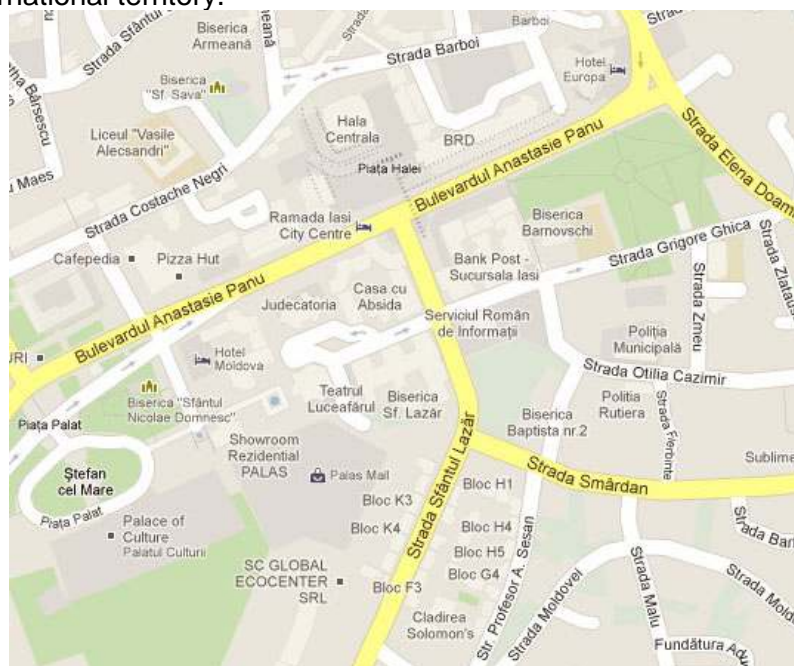


Figure 1 Iasi Street level vector map

The application can be accessed through a HTTPS secure web interface using an ID and a password. Each item of 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 localize any monitored vehicle with a precision less than 10 meters. The vehicles are displayed both on the vector map and tabular form containing the address of the location or the Hot Spot.

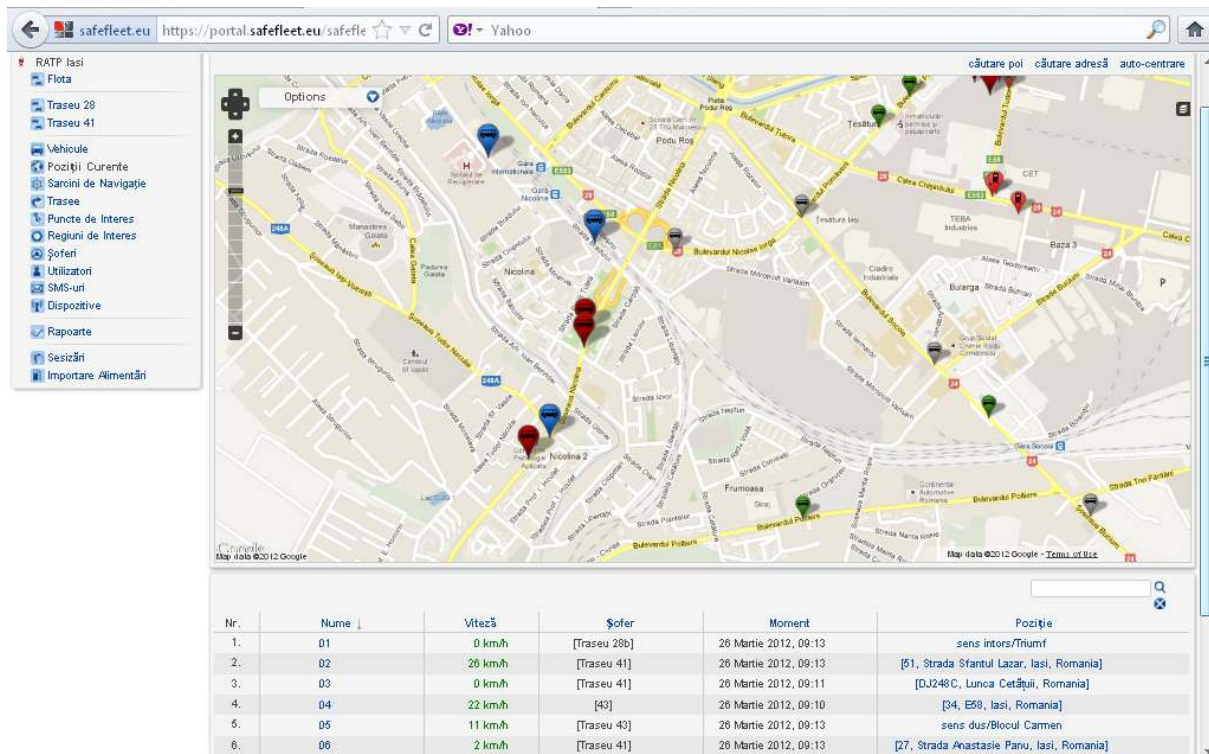


Figure 2 Position of the vehicles displayed both on the vector map and tabular form

The system is capable to recognize the detailed address of a vehicle’s position, at street level and at defined Hot Spot level.

With the SafeFleet system all the data of a certain bus can be gathered into a centralized form containing: type of vehicle, registration number, weight, average fuel consumption, the total number of registered kilometres, etc.



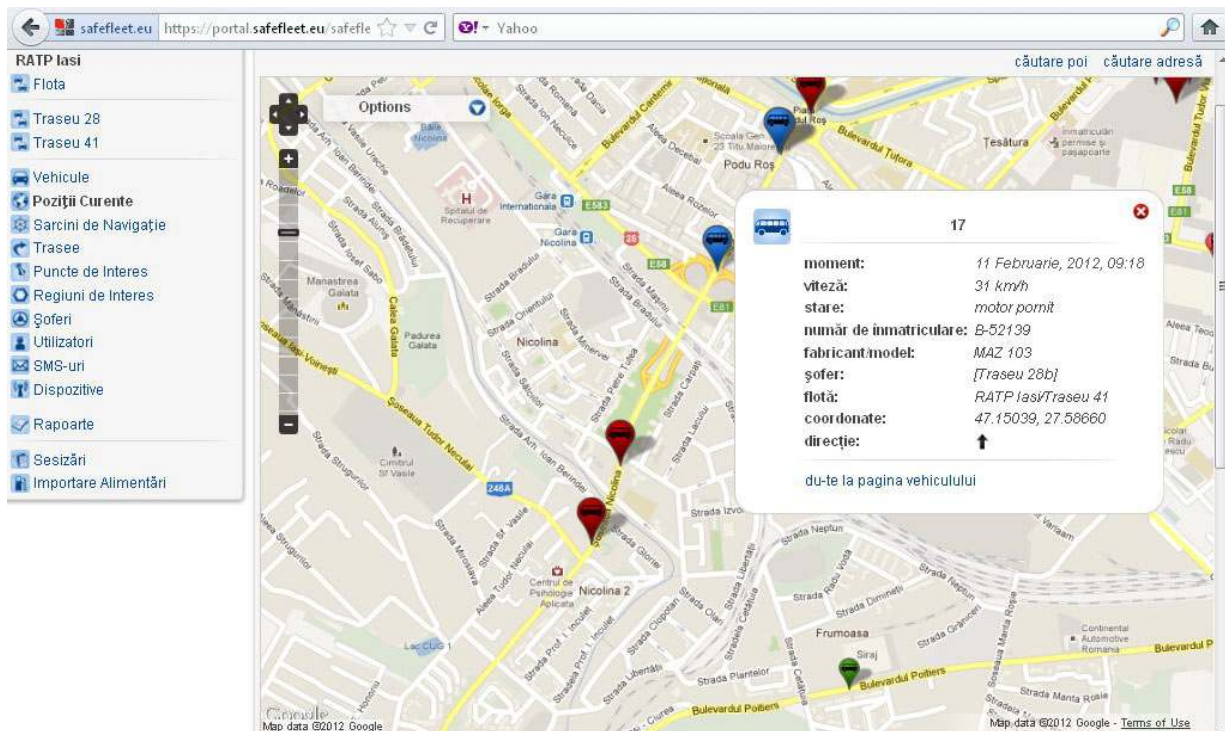


Figure 3 Real time information about the position and other data of the bus

The SafeFleet system is capable of interfacing with a vehicle's onboard computer using the Fleet Management Systems (FMS) communication standard. Through the FMS interface, one element of the data read from the bus computers is the total fuel used (TFU) since the first time of vehicle movement. This parameter is counted each time a litre of fuel is used. Based on this, the parameter can be read at the beginning and the end of a journey and, by a simple calculation, it will obtain the real fuel consumption for a certain distance.

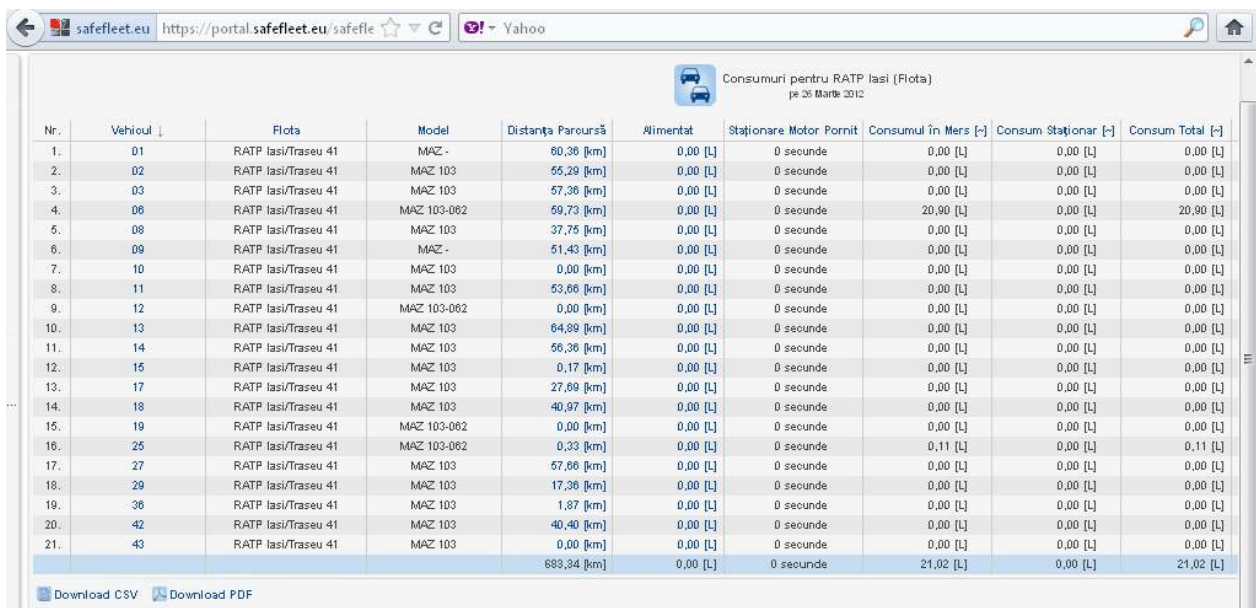
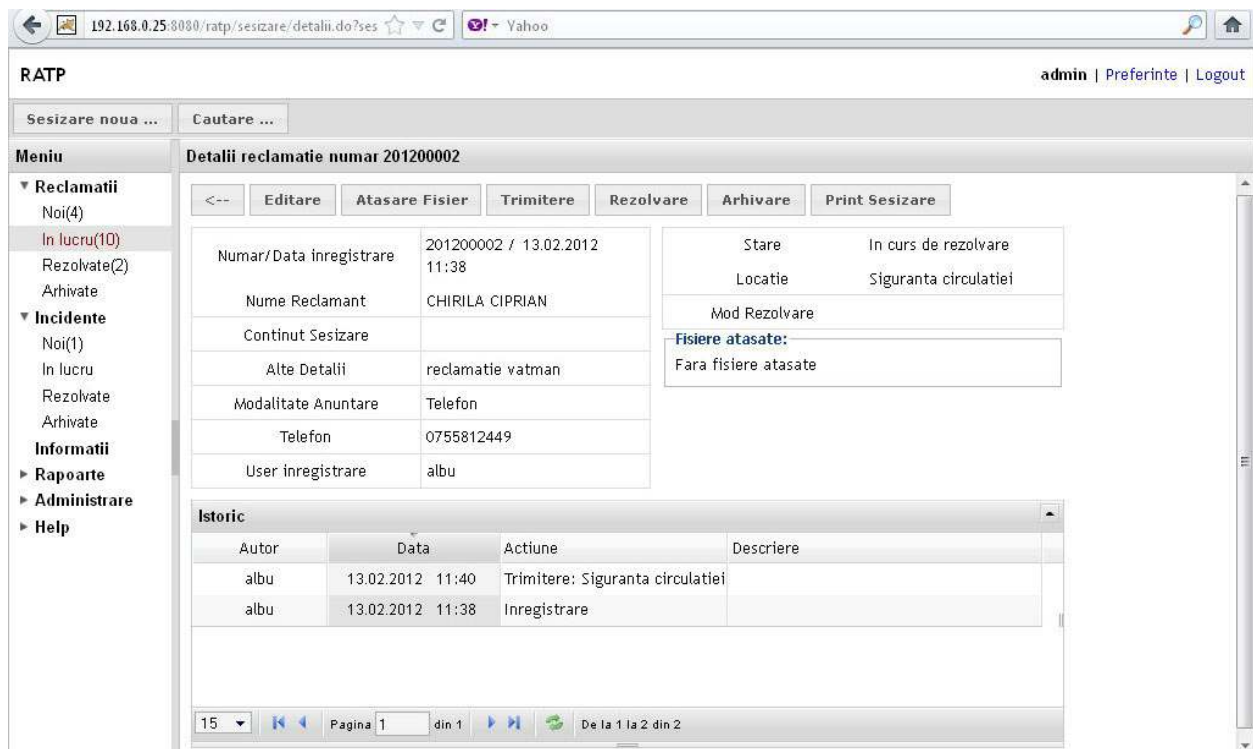


Figure 4 Graphic report of the fuel consumption

## Management of Incidents

The Incident Management software integrates with measure 38 (Telverde - 0 800 110 427 - toll-free telephone number), managing all existing and new events occurring during Traffic Management System operations. After logging in, using an ID and a password, the operator will fill in the data for a new incident, meaning: the name of the complainant, the ways he/she received the complaint (telephone, email or in writing), the nature of incident (e.g. complaint, request), details (e.g. a broken ticket within the validation machine, information about a certain journey) and observations.



The screenshot shows a web browser window displaying the RATP incident management system. The page title is "RATP" and the user is logged in as "admin". The main content area shows the details for incident number 201200002. The interface includes a navigation menu on the left, a search bar, and a main content area with a table of incident details and an "Istoric" (History) table.

Numar/Data inregistrare	201200002 / 13.02.2012 11:38	Stare	In curs de rezolvare
Nume Reclamant	CHIRILA CIPRIAN	Locatie	Siguranta circulatiei
Continut Sesizare		Mod Rezolvare	
Alte Detalii	reclamatie vatman	Fisiere atasate:	Fara fisiere atasate
Modalitate Anuntare	Telefon		
Telefon	0755812449		
User inregistrare	albu		

Autor	Data	Actiune	Descriere
albu	13.02.2012 11:40	Trimitere: Siguranta circulatiei	
albu	13.02.2012 11:38	Inregistrare	

Figure 5 A new incident

If the new recorded incident is a complaint, the operator will send it to IT Department. If it is a more serious incident (e.g. accident), then it will be sent to the Department of Traffic Safety to be solved.

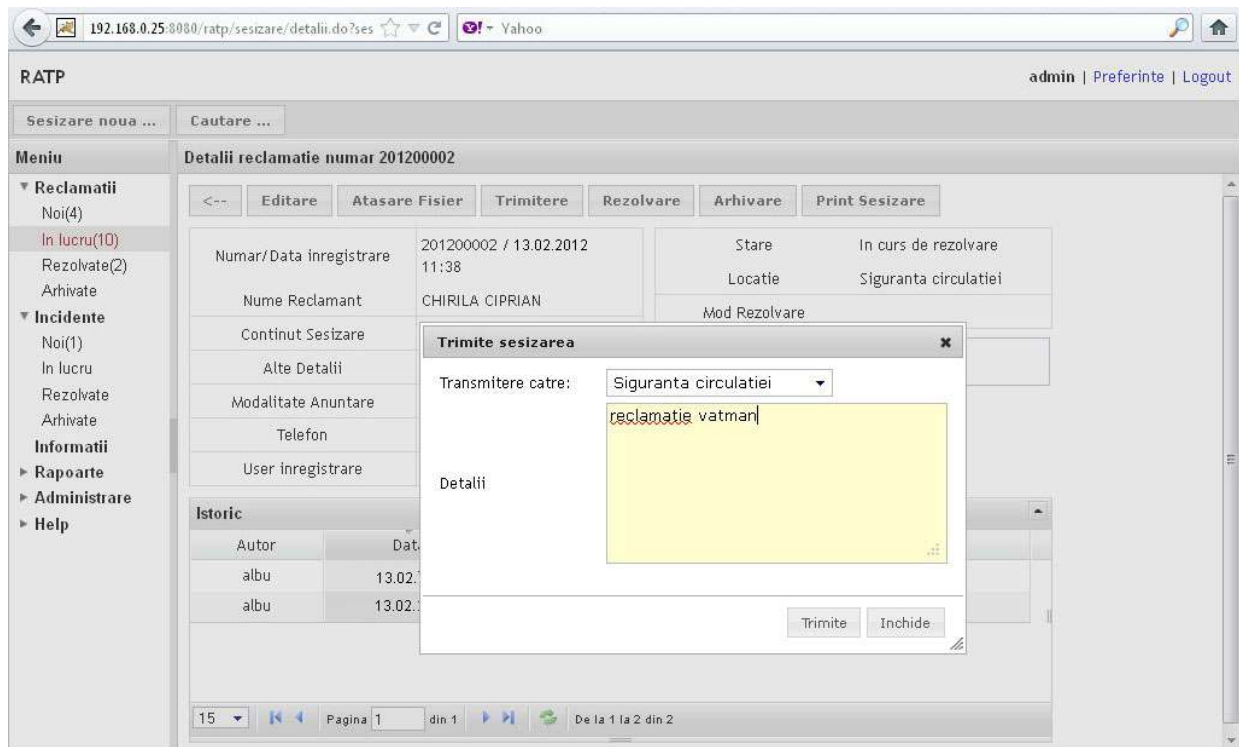


Figure 6 Sending new recorded incident

Once the incident has arrived, the department takes all necessary measures to solve the problem.

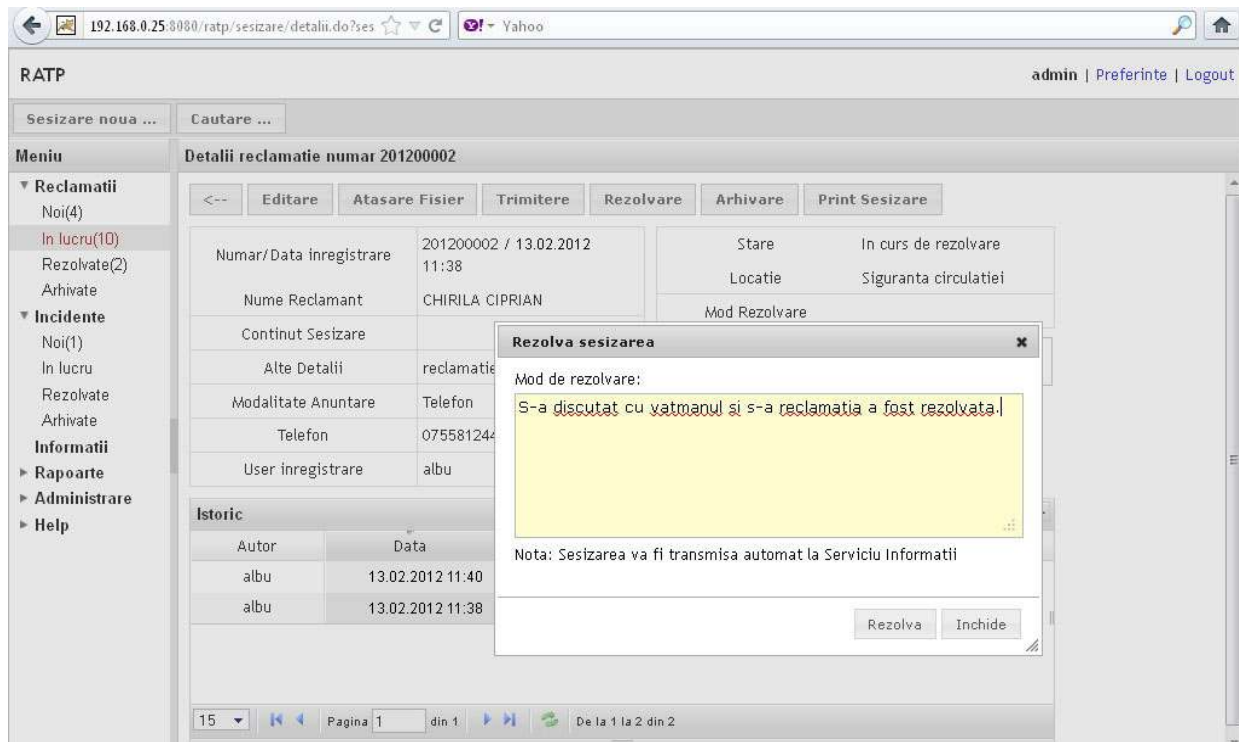


Figure 7 Solving the incident

The major impact of this measure is on the transport system. The GPS monitoring system helps to better control and plan PT services, leading to an improved quality of service, increasing the attractiveness of this mode, therefore inducing higher bus patronage. The improvement of transport quality will have a social and economic impact because we will be able to create appropriate planning for PT vehicles on every route. The Incident Management System will also improve the quality of PT services by solving problems that passengers report.

## 4.2 Main Outcomes

All the GPS satellite positioning modules have been installed on 100 PT vehicles.

The SafeFleet Portal software application that monitors all 36 trams and 64 buses is well received by the Maintenance Facility Centre operators and it offers valuable information, in real time, about the monitored vehicles. PT vehicle drivers are professionally satisfied because they can fulfil their schedule more easily.

The Incident Management System helps to solve incidents in a faster and more modern way. We expect a positive reaction from the passengers, and we will monitor through evaluation indicators.

## 4.3 Communication Activities

During the implementation of the tasks, citizens were informed through written press, radio and TV about the importance of these systems.

The reactions of media, written press, radio and TV were positive, most of them considering that it is necessary to extend this activity over the entire city.



Examples of media reaction:



<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.stiriaz.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>

#### 4.4 Problems Identified

No problems have been detected for the systems implemented in the above mentioned three tasks.

#### 4.5 Future Plans

These systems will be connected to the Traffic Management System project, co-financed by European Commission under Regional Operational Programme, which will be implemented in the entire city.