

**CiViTAS**  
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# Implementation status report on demand responsive ser- vices

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# 1. Summary

“Service on demand” is an innovative feature how to address requirements of users in need of special approach to use public transport. On city-level Ljubljana is offering organised public transport since 1901. Diverse transport vehicles were used in public transport, starting with trams in 1901 to low-floor buses used today.

With CIVITAS-ELAN, a new era of transport possibilities started. Within measure 6.1-LJU and with the use of IT technology public transport is adjusted in a user-friendly way to several categories of disabled people. Barriers LPP, Ljubljana’s PT operator, had to face on that path were mostly of informational nature and the system developed within ELAN solves most problems related to this mobility service. Some new aspects were detected during the development of the project – different groups of people with different disabilities indeed do require specific approaches and services.

A new KAVALIR electric vehicles service in the pedestrian zone was presented which proved to be much more successful than imagined. At the same time the KAVALIR service within measure 6.1-LJU is in a way a bridge to other CIVITAS-ELAN measures led by LPP. These are measure 5.2-LJU Safety and security for seniors and PT users as the KAVALIR service involves mostly seniors and measure 1.11-LJU Hybrid and CNG bus implementation announcing in a way another new technology of electric powered vehicles of a larger capacity for mobility of people between the city’s inner circle and the pedestrian zone.

Last but not least, measure 6.1-LJU Demand responding services, which is true for all other CIVITAS-ELAN measures led by LPP as well, is here to stay. This service will be further developed and will be a firm sustainable feature in LPP’s transport accessibility improvement.

## 2. Introduction

### 2.1. City of Ljubljana

Ljubljana is the capital of Slovenia and its largest city. It is the centre of the City Municipality of Ljubljana. It is located in the centre of the country in the Ljubljana Basin, and is a mid-sized city of some 270,000 inhabitants. Throughout its history, it has been influenced by its geographic position at the crossroads of Germanic, Latin and Slavic cultures.

For centuries, Ljubljana was the capital of the historical region of Carniola, and in the 20th century it became the cultural, scientific, economic, political and administrative centre of Slovenia, independent since 1991. Its transport connections, concentration of industry, scientific and research institutions and cultural tradition are contributing factors to its leading position.

The city encompasses an area of 275 km<sup>2</sup>. Its location between Austria, Hungary, the Venice region in Italy and Croatia has strongly influenced its history. Ljubljana is located some 140 kilometres west of Zagreb, 520 kilometres northwest of Belgrade, 250 kilometres east of Venice, 350 kilometres southwest of Vienna and 400 kilometres southwest of Budapest.

Among other roles, the city council drafts the municipal budget, and is assisted by various boards active in the fields of health, sports, finances, education, environmental protection and tourism. The City Municipality of Ljubljana is subdivided into 17 quarter communities that work with the municipality council to make known residents’ suggestions and prepare activities in their territories.

The city bus network, run by the public company Ljubljanski potniški promet ("Ljubljana Passenger Transport Operator", LPP), is Ljubljana's most used means of public transportation. One can also rent bicycles in the city (BicikeLJ, city bike), and there are numerous taxi companies. The city bus rides may be paid with the Urbana payment card (also used for the funicular) or via mobile phone. Sometimes, the buses are called "trole" (trolleys), harking back to the 1951–71 days when Ljubljana had trolleybuses. Until 1958, there were five trolleybus lines in Ljubljana, alongside the tram.

The tram system in Ljubljana was a small one. It was originally built in 1901. In the post-World War II era, many Yugoslav towns and cities with tram systems took out their systems, as they took up a lot of space in an era when automobiles were more important. In Ljubljana the tram's end came in 1958. In its final years the system reached a length of over 21 kilometres.

## **2.2. Javno Podjetje Ljubljanski potniški promet – LPP**

### **Tramway era (1901–1958)**

When Ljubljana had about 40,000 inhabitants, the city authorities decided to impose a "mechanized" means of transport and in 1900 Splošna malo železniška družba (English: General little railway company) was officially established. Without special ceremony, the tramway officially started to operate on 6 September 1901. On the first day 6,400 tickets were sold.

In 1929, the Splošna malo železniška družba changed its name to Električna cestna železnica (English: Electric street railway) and since 1930 the city modernized stock and tracks. With purchasing new and used vehicles the rolling stock 1940 considered 52 units. Tramway lines were connecting the city centre with the suburbs. Workshops and garages were moved to the street Celovška cesta in the suburb of Šiška.

### **Trolleybus era (1951–1971)**

After WWII, Ljubljana quickly spread and the tramway no longer withstood the growing transportation needs in the city. When personal cars were spreading to the general population, this was an additional reason for the different arrangements of the public transport which would need less street surface in Ljubljana. On May 1953 the Mestni ljudski odbor Ljubljana (English: City people's committee of Ljubljana) set up a commission that prepared the proposal on changing tramways with the trolleybus and bus service.

The transition was gradual. In the mid-fifties, Ljubljana started to regularly operate the first trolleybuses and buses. The tramway finally ceased to operate, Električna cestna železnica was renamed to Ljubljana-Transport. The last journey of a tramway was on 20 December 1958. Like the tramways, trolleybuses are also electrically powered and therefore are depending on the power lines installed in the city.

The experiences with the operation of the trolleybuses were not the best. Trolleybus power collectors often "fell off" and had to be reinstalled. In winter time there were additional problems caused by snow and a road-sanding with salt. Salt water often came into contact with electrical wiring and caused short circuits. Sometimes the entire body of the trolleybus was energized with electricity. Passengers were often experienced shock if they touched the metal parts of the vehicle. The last trolleybus vehicle in Ljubljana drove on 4 September 1971. On the next day the trolleybus lines were completely replaced by buses.

### **Bus era (1950-today)**

The sixties and the seventies of the 20<sup>th</sup> century had brought unimagined development of urban public transport and the company. In 1971 the company was renamed to Viator which gradually expanded its operations throughout Slovenia. Urban transport operations developed into other services which were long distance passenger transport, freight and tourist traffic which boosted tourist-agency activities, and then continued with the construction of lifts to Vogel, Velika planina and Zatrnik. From transport and tourism it was only a small step to catering and taxi services. Since 1971, the company is engaged exclusively in the operation of public transportation with buses.

In 1977, Viator formed a link with the company SAP into SOZD SAP Viator. Further merges and alliances followed between different transport, tourism and hotel organizations throughout Slovenia which resulted in the INTEGRAL SOZD. In this context today's business name occurred, labour organization Ljubljanski potniški promet.

In 1989, the LPP decided to withdraw from the Integral, since there were any more development opportunities for continuing operations of urban public transport to Ljubljana, its people and its visitors, and its suburbs. LPP has become a public company serving residents of the capital and all those who live in suburban municipalities. Since 1994 LPP acts as a public company under Ljubljana. It is a limited liability company.

## **3. Situation before CIVITAS-ELAN**

Before the start of the CIVITAS-ELAN project LPP did not consider transport for disabled as an important issue to be addressed with special care. Due to the ELAN project, LPP as public transport company developed a new perspective towards different focus groups. Handicapped people, seniors and other groups with specific disabilities needed some specific changes in public transport processes to be regarded as equal participants in public life and to have access to everything taken for granted by people without disabilities.

### ***3.1. No service adopted for the disabled***

Before CIVITAS-ELAN there was no dedicated service for handicapped people. Nobody even demanded that the PT provider had to do something for a certain group of people with disabilities. Besides the fact that in LPP nobody thought about how to better transport disabled people, LPP only owned classic, high buses with stairs. First demands for equal transport possibilities or first demands for equal treatment regardless of (dis)abilities were detected when low floor buses were included in the fleet. At the beginning, LPP responded negatively to all these questions and demands.

LPP as a public transport provider until CIVITAS-ELAN did not have a specified approach or service suitable for the disabled. Administrative regulations within LPP were not in favour of the impaired especially with regard to defining driver's tasks regarding the procedures to address the needs of the disabled. No special attention was given to this issue in the driver's trainings and defined instructions for users did not exist.

### ***3.2. Transport service for the disabled***

Transport for disabled citizens was and still is organised within different groups or clubs. The major disadvantage of working with such organisations is that transport is reduced to mem-

bers of the organisation. Vehicles are adopted to accommodate one or two passengers on wheelchairs. Transport possibilities are poor due to the restriction to a membership of a certain organisation and “importance” of a member.

Some more agile individuals used LPP, but there were obstacles mainly of informational nature. Transport itself was not organised to offer independent and round the clock service. Planning of transport is limited to reserving one or more days ahead.

## **4. Measure 6.1-LJU Demand responsive services**

### **4.1. Concept**

The main idea was to ensure mobility for the disabled in the same “range” as for all passengers regardless of their limitations. At the beginning of the ELAN project there was a plan to purchase one special vehicle to ensure transport on call. The concept failed due to the fact that LPP would just represent another transport provider for a group of disabled people on wheelchairs and one vehicle would not have been able to cover the entire demand. The concept changed during the project, also as a result of the feedback gained from several organizations of disabled people, to an offer of transport to all groups of disabled instead, implemented on LPP’s regular buses. Comparing different aspects of demands, the logical consequence is a universal solution for all passengers regardless of their limitation and regardless of service time limitation.

The final approach to demand responsive services developed within measure 6.1-LJU ensures an appropriate level of service for all interested and potential users on the network of LPP’s bus lines with the capacities that LPP’s bus fleet can provide. The biggest and the most important step in this process is the provision of information on transport possibilities in the right place and in right time frame.

### **4.2. Demand specific**

At first, a decision was reached on how to address the specific demands of different groups of handicapped. All groups addressed by LPP had one common issue that had to be handled properly, information flow, which is crucial for anyone who uses the transport system. Information flow is regarded as a two-way communication process, from the provider to the user and backwards. At several occasions and at several meetings with focus groups getting sufficient information was repeatedly mentioned as a challenge. On the other hand, for LPP information about transport demand, transport execution and connection of these phases is essential to be able to define the right approach to offer and use the public transport network.

Due to the fact that handicapped people have specific demands and systematic handling is needed, a universal tool had to be developed. This software tool is actually an information system. With this system LPP can handle different parameters regarding the needs and demand of each individual user who chooses the offered possibility to plan and use the public transport network and its service.

The service offered through measure 6.1-LJU is an innovation not only for LPP, Ljubljana and ELAN cities, but for the whole CIVITAS community. Special user groups addressed in this measure are individuals with mental development difficulties (Down syndrome, autism, etc.). In the beginning, also LPP did not know how to meet the needs of these user groups

when they are using regular public transport. While they are not physically disabled they still need a dedicated approach to use public transport services on their own. A programme to enable independent usage of public transport started with training sessions for users and drivers at the same time. A special card was presented to assure safe transfer of such users from the start of the trip to the final stop. Drivers had an extra training for this group of passengers due to the fact that they do not need help to enter or exit the bus. They rather need “control” or help to exit at the right stop and an adequate treatment if needed.

### **4.3. On demand software tool**

The on demand software tool was designed by TELARGO to cater for a need of demand responsive/ paratransit transport. The on demand software tool is comprised of two main components – one is the back office Trip Planner application which provides the dispatcher with the ability to send a message to the vehicle informing the bus driver that a handicapped person will enter the bus at a particular bus stop. The other feature is the Mobile Unit/ driver interface application which provides for the display of the messages to the drivers.

When a disabled passenger contacts LPP via its call centre, a trip order request is initiated. The following information is requested from the passenger (caller) in order to enter applicable parameters into the on demand software tool: time frame when the trip will be executed (approximate time when passenger would like to start the trip) and trip destination (start/ end location). It is also desirable to report on any special transport requirements, such as number of passengers (in case the disabled person is travelling with a companion), space required for the wheelchair, limited time to drive the bus, etc.

Afterwards, the dispatcher – with the help of the on demand software tool/ trip planner application – checks if the requested trip is available (feasible) based on the requested timeframe and other special requirements versus available buses (applicable buses for transport of disabled passengers; buses suitable for carrying disabled passengers are low-floor buses, some of them also equipped with ramps for easy entry). If the application confirms the availability for the requested trip, the dispatcher informs the passenger/ caller about the approximate times and locations of all interconnections to reach the desired location and bus numbers (usually bus lines and/ or registration number) (the passenger actually receives “interchange points” or some kind of travel plan). When the passenger has confirmed the adequacy of the plan, the dispatcher with the help of the application chooses the passenger’s plan and the application automatically triggers the appropriate alerts/ messages to drivers which appear on the user’s screen of TELARGO’s mobile unit and on the touch screen of units used for electronic payment. The application is used to plan the trip for the current day or several days ahead.



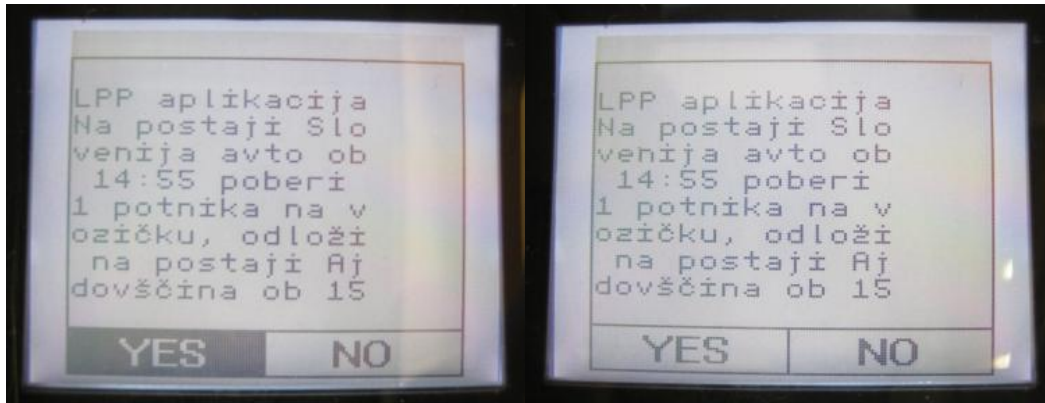


Figure: Example of confirmed and not yet confirmed messages notifying driver of disabled passenger entering the bus at specified bus stop and existing bus at specified bus stop »Message – pick up passenger on bus stop Slovenija avto at 14:55 and drop him off at bus stop Ajdovščina at 15« – both on TELARGO's mobile unit driver interface

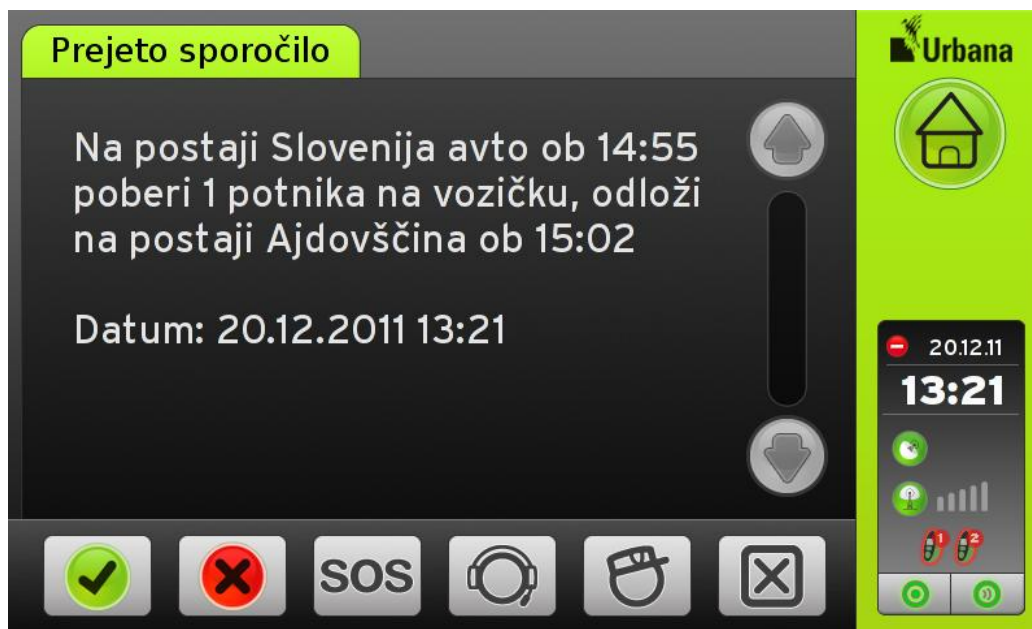


Figure: Example of not yet confirmed message notifying driver of disabled passenger entering the bus at specified bus stop and existing bus at specified bus stop on touch screen - » Received Message – pick up passenger on bus stop Slovenija avto at 14:55 and drop him off at bus stop Ajdovščina at 15:02; Date: 20.12.2011 13:21«

The message displayed on the driver's interface includes the following information: bus stop name and time when the disabled passenger will enter the bus, and information at which bus stop it is expected for the passenger to exit. The driver can send a reply to the dispatcher confirming the message or in case there is perhaps no space for a disabled passenger (it is assumed that there is a space for two wheelchairs) on the bus or any other problem occurred, the driver can decline the message and state the reason. Messages are sent back to the on demand software tool (over GPRS) which enables the dispatcher to undertake appropriate action and if

necessary also informs the passenger of any trip change. The driver can also receive other messages from LPP's dispatch centre as well as receive hands-free voice calls.

### On demand software tool – trip planner application

The application is accessible only to authorized users with designated username and password. When a user/ dispatcher successfully logs on, the main menu opens. Most of the window is occupied with the Google Transit application in which the on demand software tool is integrated. Google Transit is used for the dispatcher to quickly determine the start and end location as reported by the passenger.

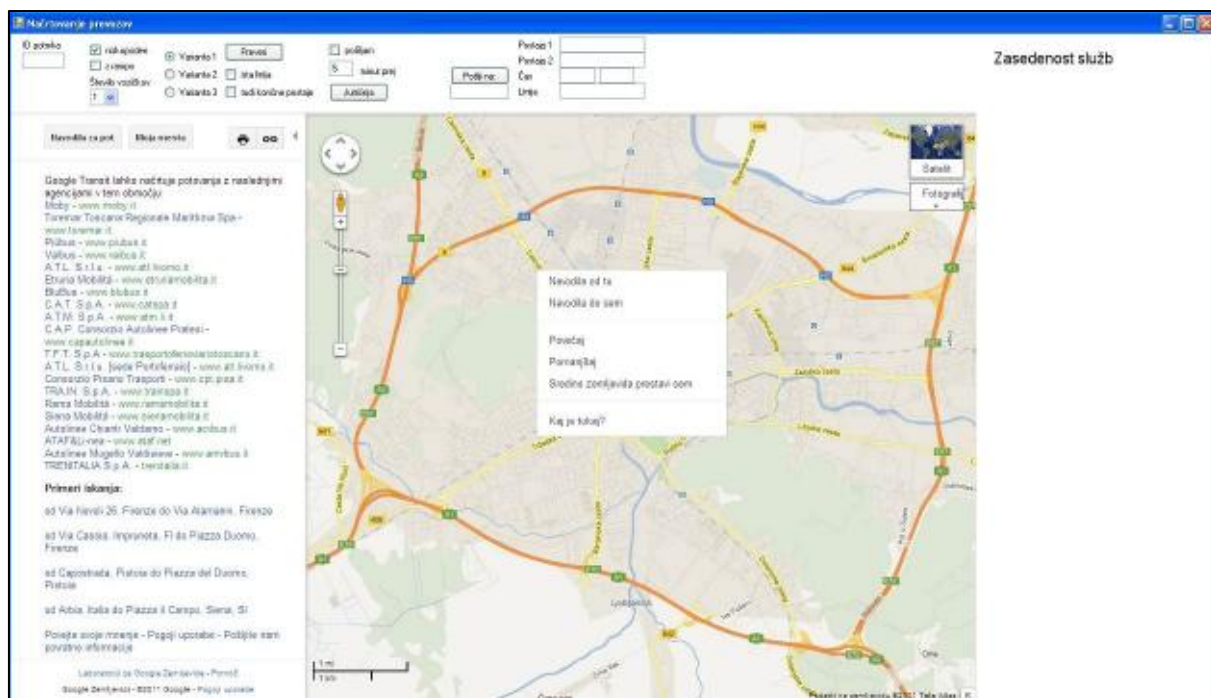


Figure: On demand software application – back office interface

The upper part of the application is aimed at entering applicable trip-related information reported by the passenger when they call LPP's call/ dispatch centre. If the passenger is already registered in the database then some of the information is prepopulated (ID, name, surname, special transport requirement, e.g. low-floor bus with ramp, etc.).

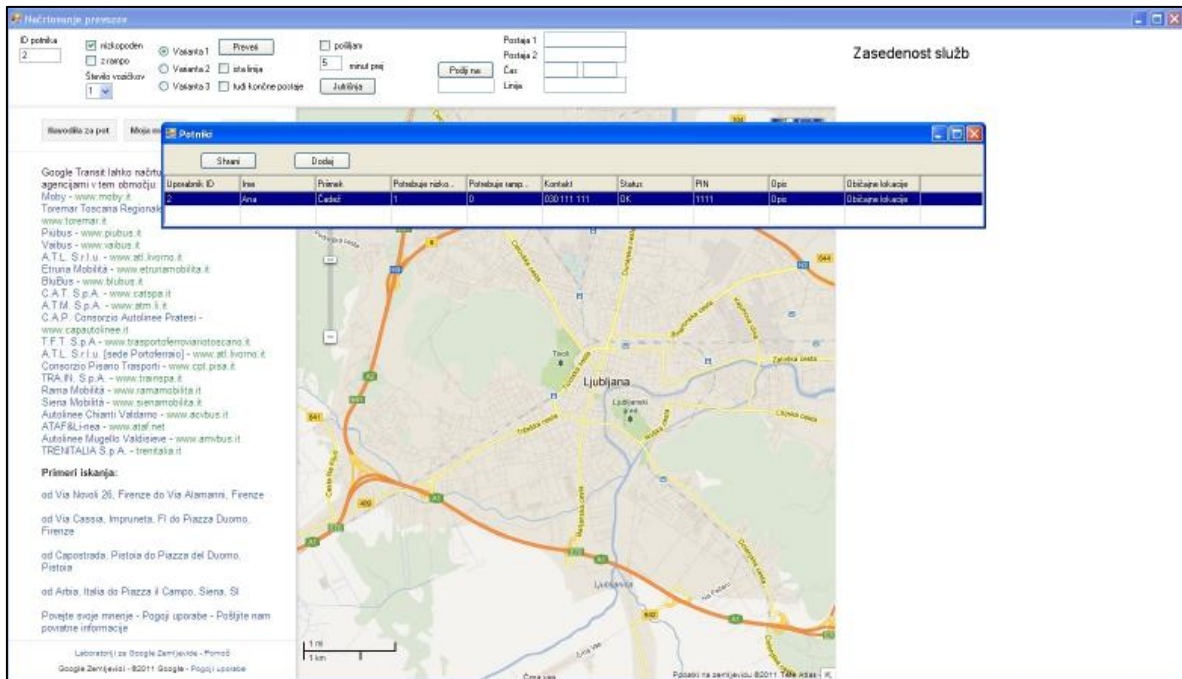


Figure: On demand software application – passenger info

When the dispatcher enters all the requested transport data, he/ she presses the “Check” (Preveri) button. After a couple of seconds, the application returns the result – Transportation variant window opens – listing all the available buses in the particular time frame.

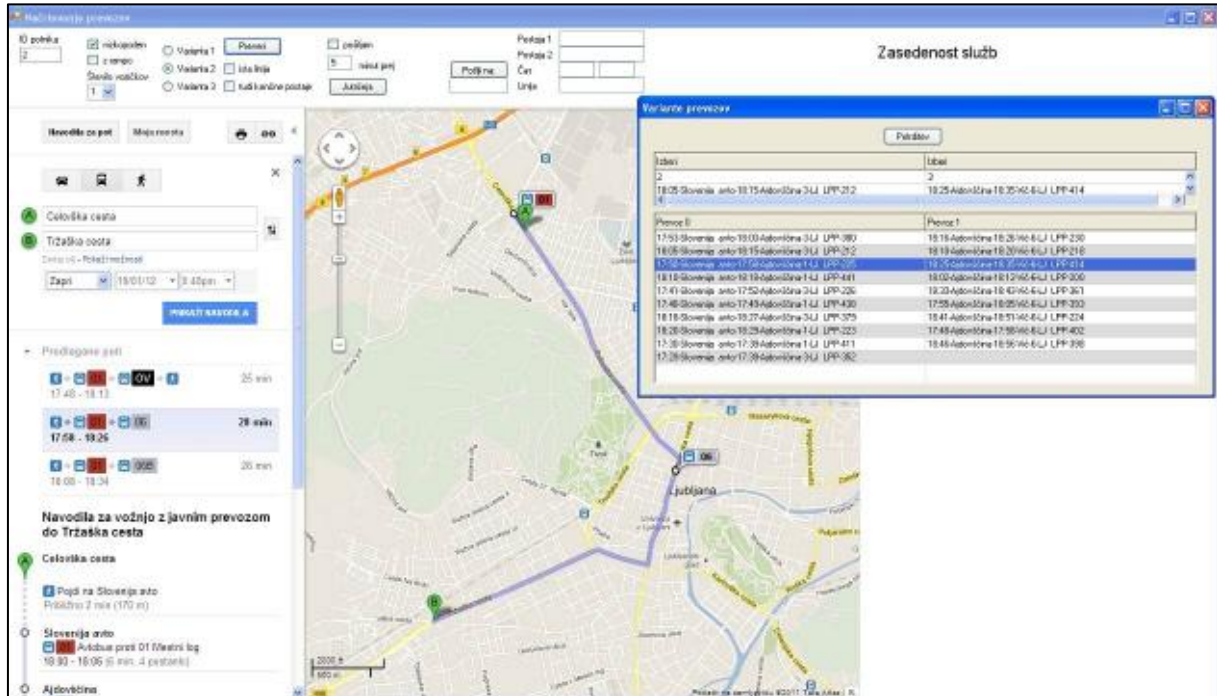


Figure: Transportation variants

Based on passenger wish/ feedback, the dispatcher selects the applicable variant and confirms the selection. Afterwards, the message window pops up with a predefined message based on the selected transport variant, while there is also a possibility for the dispatcher to enter additional text for the driver.

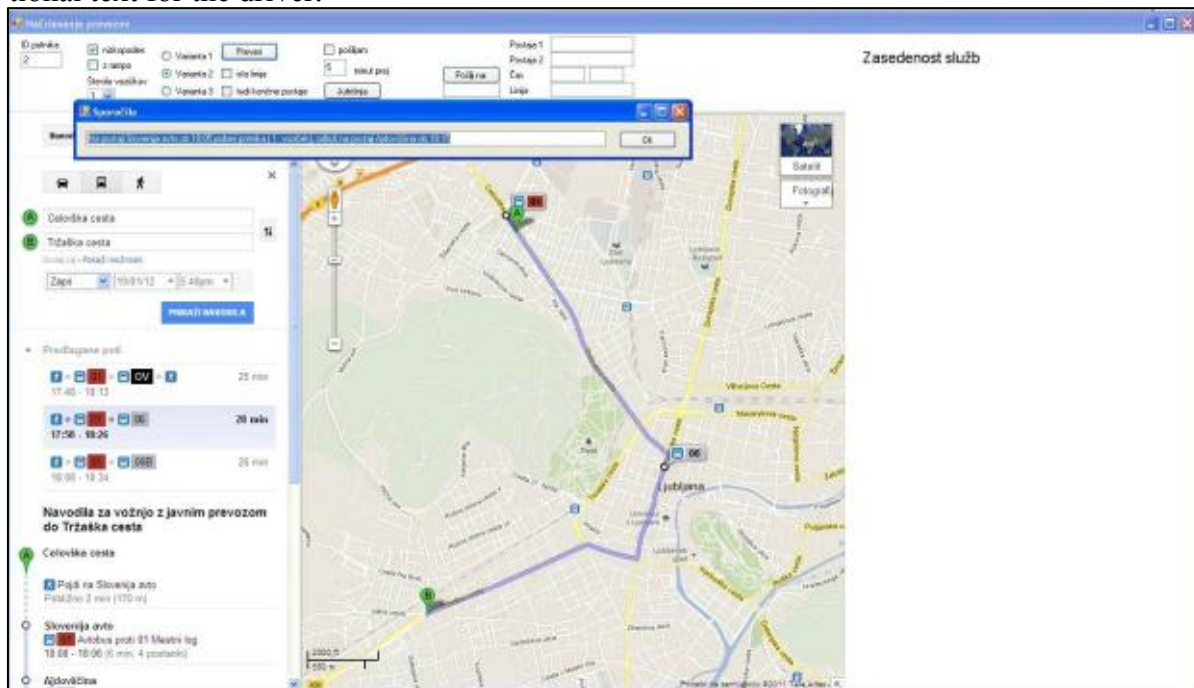


Figure: Message window for driver

The message is sent to queue and is transmitted to the bus a couple of minutes (configurable) before the expected bus arrives at a particular bus stop. Every scheduled trip plan for disabled passenger is displayed on the right side of the application; sorted by bus line number including information about driver and vehicle number.

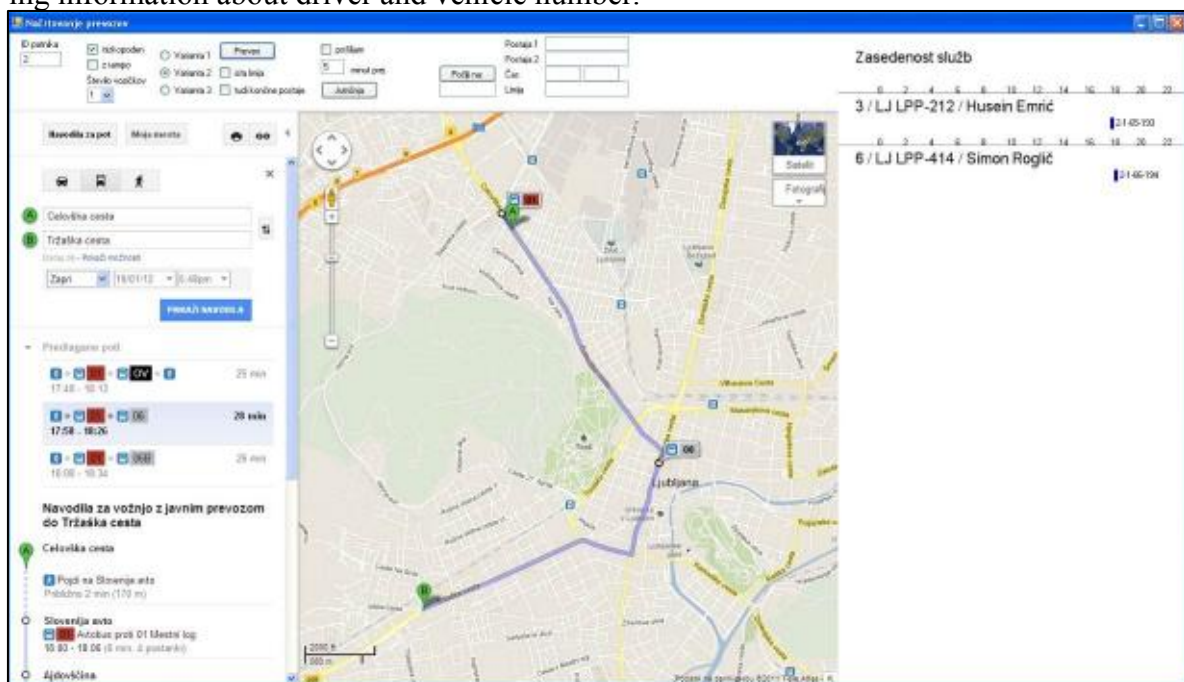


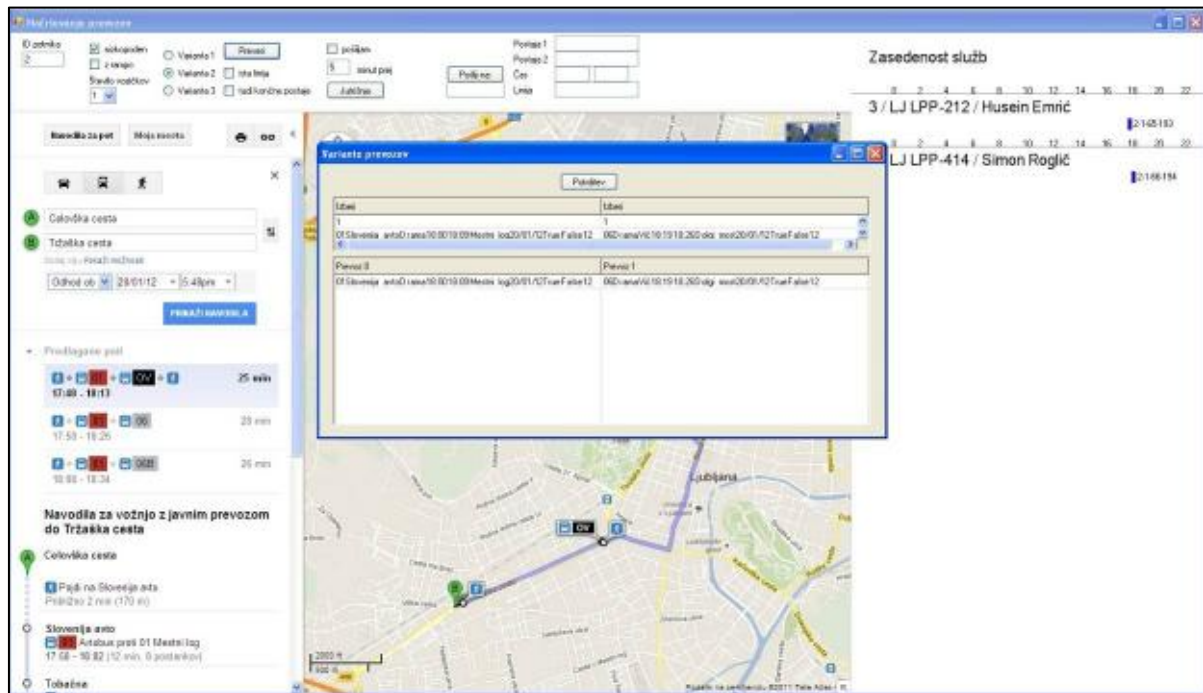
Figure: Status of Scheduled trip plans

The line colour represents the current status of scheduled trip plans:

- Blue: the message is in queue to be sent to the bus
- Grey: the message was sent
- Yellow: TELARGO unit received the message
- Orange: message read by driver
- Green: message acknowledged by driver
- Red: message not confirmed by driver

Status alerts are updated in time intervals of 10-20 seconds.

The application is used to plan the trip for the current day or several days ahead.



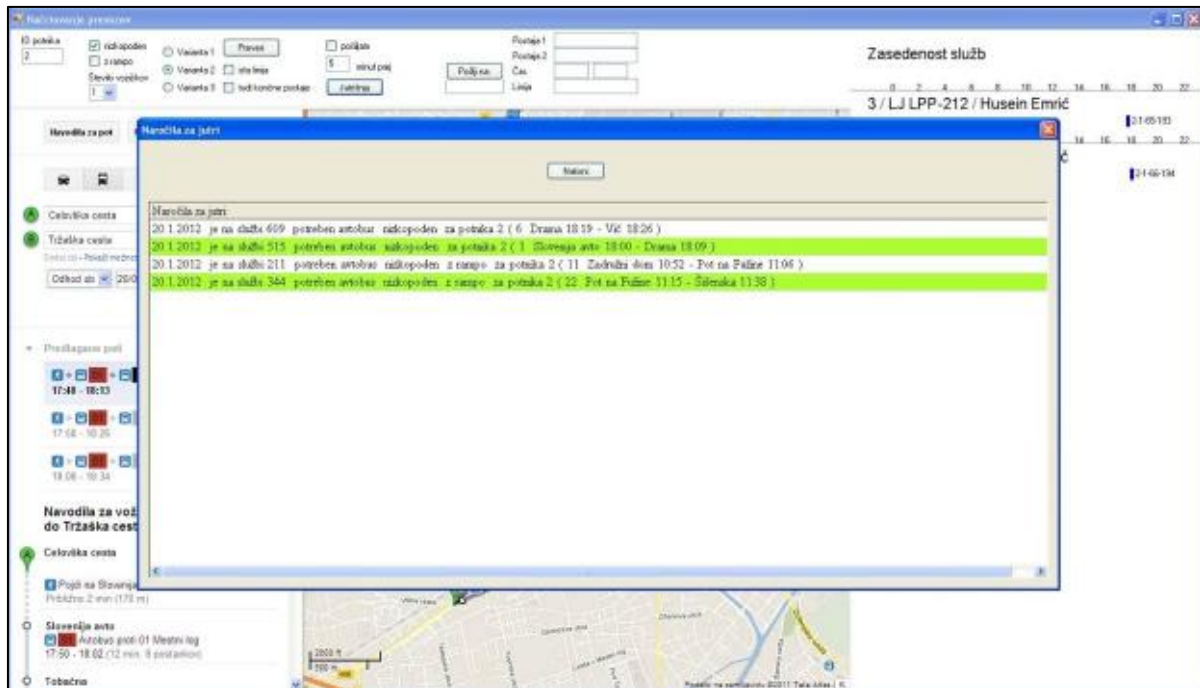


Figure: Planning the trip for later day(s)

#### 4.4. Interconnectivity with other measures and PT services

It is impossible to focus “demand responsive services” to only one specific disability and to only one operational area. Dealing with different aspects of transport adapted to specific user groups led to different questions on different aspects how to fulfil transport needs. Every group of passengers has their own demands and expectations towards mobility.

A new aspect regarding the service on demand appeared when the old city centre got a huge pedestrian zone and consequently was closed for traffic. Now, a lot of points or places of interests are located in the pedestrian zone. Beside groups with disability there are old people having a problem with walking. When the pedestrian zone was introduced a big demand to reach certain places within the huge pedestrian zone (market, church, etc.) was expressed especially by seniors. Seniors and their needs or demand for mobility in the pedestrian zone resulted in special feature called KAVALLIR.

#### 4.5. KAVALLIR

When large parts of the city centre were closed and transformed into a pedestrian zone and a reduced speed zone, a new transport possibility was presented to the public. A clean electric vehicle operating in the pedestrian zone was introduced and a new innovative service was presented at the same time. Transport on demand was organised with two KAVALLIR vehicles for 5-6 passengers. The KAVALLIR was the first transport possibility with fixed operating times but also with an on-call function. With the KAVALLIR LPP tested a system for demand responsive service on its entire bus fleet. The current service is very well accepted and the

number of users is growing every year. Both vehicles are operating nonstop from 8:00 to 18:00 every day, except during the winter. Due to the fact that the KAVALIR is an open car and has no protection against severe weather conditions and low temperatures, operating time was limited.

KAVALIR is a service accessible in the pedestrian zone providing easier access to points of interest within it. No special activities were related to this service. A telephone number was advertised and the service is well accepted. Transport is planned to cover transport needs for anyone but it is mostly used by older people. There were no comments on how to improve the service. A lot of praise was given from different kinds of users; especially tourists are positively surprised discovering this feature.

In the morning the service is mainly used by the elderly that are arriving at the border of the pedestrian zone by bus and then they use the KAVALIR service to reach their destination within the pedestrian zone. In the afternoon the KAVALIR is mainly used by tourists for sightseeing of Ljubljana's old town. The service itself is very popular and well accepted by older residents within the pedestrian zone due to the fact that the KAVALIR represents a good alternative for their mobility needs. With this kind of service LPP filled the gap where otherwise there would not be any transport service.

The KAVALIR as service was used as test field for the demand responsive application developed within this measure for the service for the disabled for the bus fleet. A lot of practical solutions were found using a software tool in real time with real data. Nevertheless, the KAVALIR does not use the software tool for its operation due to the fact that it operates in a relatively small area and to go through the complete procedure of announcement and reservation of capacity is too complicated. Still it is a service on demand. Demand requests are not counted and evaluated because demand is made via cell phone. Users are generally satisfied and the service faced no critique or bad comments since it started.



## 5. Transport activities, trainings and dissemination activities

### 5.1. Transport activities

During the planning of this CIVITAS-ELAN measure LPP had started with an idea to provide mobility for the disabled with a special vehicle of its own. LPP's intention to offer a user-friendly and at the same time an economical and environmental service for wheelchair users did not reach the expectations or needs of this target group. A long and detailed dialogue with several organizations representing disabled people led to a completely different approach.





Based on the discussion with the disabled LPP has decided to offer to all categories of disabled people mobility in the sense of a possibility to use all LPP's facilities without any restrictions. There is no doubt that the later offer means a huge step forward in social inclusion of several categories of disabled as well.

When focus groups were contacted and several meetings with representatives of different organisations were held, a new approach towards this issue developed. Different disabilities require different handling and different approaches. Barriers were defined and by understanding the needs and expectations of several different disabled groups of people, LPP began to develop an approach based on own possibilities on one hand and user expectations on the other hand.

For this approach, LPP developed a software tool which allows disabled people to gain information about transport possibilities and reserve space on a vehicle (only two people with wheelchairs can be accommodated on one bus). Currently, reservations can be carried out via telephone.

Data for the registration in the system are entered by the dispatcher at LPP and all data related to each specific of disabled passenger. An ID number is appointed to a person for easier communication when a ride is reserved. On the other hand LPP can have a statistic overview of the usage and travel habits. In fact if LPP has data and information about the needs and requirements of passenger, reservations can be handled much faster and without possible complications and misunderstandings during the process of registration and trip demand.

When a disabled passenger decides to use the PT service provided by LPP he can contact the call centre via telephone and a procedure for the trip order request is initiated. The following information is requested from the passenger (caller) in order to enter applicable parameters into the on demand software tool: time frame when the trip will be executed (approximate time when passenger would like to start the trip) and trip destination (start/ end location). It is also desirable to report on any special transport requirements, such as number of passengers (in case the disabled person is travelling with a companion), space required for wheelchairs, limited time to drive the bus, etc.

Afterwards, the dispatcher – with the help of the on demand software tool / trip planner application – checks if the requested trip is available (feasible) based on the requested timeframe and other special requirements versus available buses (applicable buses for transport of disabled passengers; buses suitable for carrying disabled passengers are low-floor buses, some of them also equipped with ramps for easy entry). If the application confirms the availability for the requested trip, the dispatcher informs the passenger/ caller about the approximate times and locations of all interconnections to reach the desired location and the respective bus numbers (usually bus lines and/ or registration number) (passenger actually receives information about “interchange points” or some kind of travel plan). When the passenger has confirmed the adequacy of the plan, the dispatcher with the help of the application chooses the passenger’s plan and the application automatically triggers the appropriate alerts/ messages to the driver or multiple drivers if the trip demands more buses.

As mentioned, different disabilities do require different approaches in handling different passenger’s needs. With the help and suggestions from the users, LPP adopted new internal regulations and instructions for drivers to be able to perform their work according to users’ expectations.

A customer with physical disabilities requires that the driver helps this person to board a bus and to leave it. If the passenger has registered in advance via the software tool and announced the specific demand for transport, there is no communication barrier and with the information for the driver derived from the system the procedure is smooth.

LPP decided to pay special attention to users with difficulties in mental development (down syndrome, autism, etc.). Often, such a user is accompanied by another person. Due to the “demand responsive service” such users are now more independent and can go to work or school on their own. For this, the user presents a special card with basic data to the driver when entering the bus. The driver now knows how to help the passenger (supported by the information gained from the system if the passenger planned the trip in collaboration with LPP). The special card means that the driver has to pay attention to this passenger when he or she should leave the bus. In case of an emergency the card also contains contact information on who to address in case of unforeseen problems or misunderstandings. The card is crucial due to the fact that this group of users may have communication problems when facing unusual situations.



Trainings and workshops for different groups of disabled people took place at LPP's headquarters and in the field (real life situation).



The measure was presented at different events, e.g. the European Mobility Week, LPP's Open Day, the Day of Accessibility of the Paraplegic Club of Ljubljana, etc.

## 5.2. Trainings

Meetings with focus groups were held where detailed instructions on how to use the system and what are the benefits using demand responsive services were presented. Disabled people had several trainings, also involving guide dogs.

Dedicated training sessions were held for people with difficulties in mental development (Down syndrome, autism, etc.). These were developed by LPP's CIVITAS-ELAN team due to the fact that no similar practice could be found anywhere else. As a result LPP developed its own system on how to perform such trainings. For each individual LPP had to adopt certain activities to reach the desired results depending on the individual level of disability. During the implementation of the system LPP found out that there are different details and needs to be considered when working with disabled people. First LPP had to become acquainted with the perspective of disabled people. The first step that LPP has made during the presentation of the system to different groups of disabled was to complete the understanding of their needs and expectations. One of the key steps in this process was to include individuals of different groups of disabled to present their actual problems they are confronted with. Appropriate solutions were the discussed together.

The programme for trainings with LPP's staff was tailored to meet the needs of the users of this service. Trainings for drivers were held at the same time. All LPP drivers participated in training sessions which communicated instructions and guidelines.

### 5.3. Dissemination activities

Also, information about the different aspects of the service on demand was disseminated. The KAVALIR service was advertised on Ljubljana's web page: <http://www.ljubljana.si/si/mol/novice/2106/detail.html>; on several informational portals like siol.net: [http://www.siol.net/avtomoto/zanimivosti/reportaze/2012/06/rep\\_kavalir.aspx](http://www.siol.net/avtomoto/zanimivosti/reportaze/2012/06/rep_kavalir.aspx). The KAVALIR also was a good platform to start dissemination the “demand responsive services” that will be introduced on buses. One of the articles explaining the new service by LPP is: <http://www.blog.uporabnastran.si/2012/04/16/kavalir-se-vraca-v-center-ljubljane-skupajz-novo-storitvijo-prevoz-na-klic-na-avtobusih/>.

The step-by-step introduction of demand responsive services was included in “advertising” the new approach for the disabled, disseminating the “on call service” along with information on the KAVALIR service: <http://www.javniprevoz.si/prevozi/avtobusni-prevozniki-slovenija/kavalir-in-testna-uedba-storitve-prevoz-na-klic-za-gibalno-ovirane/>. Several articles were published in newspapers: [http://www.dnevnik.si/tiskane\\_izdaje/dnevnik/1042521025](http://www.dnevnik.si/tiskane_izdaje/dnevnik/1042521025). Dissemination activities were connected with other CIVITAS-ELAN measures like 5.2-LJU “safety and security” concerning seniors and their needs and expectations related to public transport services. On the other hand, measure 1.11-LJU Hybrid and CNG bus implementation is connected with the KAVALIR service because the service is conducted with electrical vehicles and combines at least two measures conducted by LPP within the CIVITAS-ELAN project.

## 6. Future plans

CIVITAS ELAN is actually a starting point for a new connection between users and the PT provider. Basically, the system was designed for disabled, but with the adaptations and changes to the first concept of the programme LPP found out that system – when slightly adapted – can also be used for other transport possibilities, especially on routes where regular operation would not be possible.

For example, the operation of connections between different city districts out of regular operating times could be operated by service on demand. Trips, operating time and routes are pre-defined in order to enable service on demand. With the use of the software tool the process is basically the same as with the disabled, with the exception that in this case no restrictions on vehicle specifications are needed.

## 7. Conclusion

As explained above one of the major problems that had to be overcome at the start of the measure was the delay in the development and implementation of the software tool for the demand responsive service on regular buses. The software tool had to be adapted several times. As explained above some changes in the system had to be made while using the system by adjusting it according to intermediate usage results.

Due to an intensive citizens' engagement process the software now is able to meet the user's needs and expectations. During the course of measure implementation many aspects were dealt with, e.g. how to reach focus groups in the right way and which is the right communica-

tion approach. At the same time disabled people gained information about what to do and how to be able to use regular public transport services in the same way as other customers.

LPP is proud that measure activities are such a success and hence activities will continue beyond the lifetime of the CIVITAS-ELAN project. The project was actually merely a starting point of features offered to users in need of a dedicated approach to ensure equal transport possibilities for all.

All activities implemented within this measure became permanent features in LPP's service. With the financial support of ELAN services of LPP extended to the pedestrian zone. The KAVALIR service is the only transport service within the old city centre and is going to offer its service long after CIVITAS-ELAN. "Demand responsive services" are a unique service for disabled people to use transport as equal participants in public life, and CIVITAS-ELAN was only the first step in introducing new transport possibilities which became and from now on will be a permanent service of LPP.

## **8. Sources, References and Appendixes**

### ***8.1. Sources and references***

- Tadej Brate (1997). Ljubljanski tramvaj včeraj, danes, jutri = Ljubljana tramway yesterday, today, tomorrow. Tehniški muzej Slovenije. ISBN 961-90361-3-1.
- Tadej Brate (2005). Zgodovina mestnega prometa v Ljubljani. LPP d.o.o.. ISBN 961-91685-0-X.
- Tadej Brate (2008). Ljubljanski mestni promet v slikah. Kmečki glas. ISBN 978-961-203-343-9.

## **8.2. Appendix 1 – Assessment of user, stakeholder and provider needs (6.1 – WD1)**

### **Summary**

In January 2010 the City of Ljubljana's Developments and Investments Office conducted a survey on the travelling habits of disabled people in Ljubljana for LPP to be able to reach objectives planned within measure 6.1-LJU Demand responsive services. Altogether, 164 questionnaires were filled in and evaluated.

The title of the survey was "Travel habits of handicapped persons in Ljubljana" to assess the travel habits of handicapped people living, working, studying, socializing and shopping in Ljubljana. The goal of the survey was to adapt local public transport to the needs of handicapped people.

Handicapped people from different organisations were asked to participate in the survey through their organisations.

The results show that 30,64 % of respondents use vehicles of their organisation for their daily activities. 30,64 % of respondents use private vehicles for their daily activities.

Public transport is used by students and people with hearing and seeing problems (21,97 % of respondents).

26,72 % of respondents think that services for handicapped people in local public transport should improve (with electrical ramp).

### **Survey results in detail**

The questionnaire has been prepared in order to gather data from several organizations of disabled on their travel habits. Special emphasis was on travel habits, especially the purpose and itinerare of daily routines. 164 people have taken part in this survey, of which 58,33% were female and 41,67% male.

#### **1. Aid used for walking or moving**

- crutches
- stilt
- manual wheelchair
- electric wheelchair
- other

#### **2. other disabilities**

- deaf
- blind

#### **3. What mean of transport do you usually use for your daily routine (give 1 to the most frequent choice and graduate until 5)?**

- public transport
- taxi
- disabled organization vehicle

personal vehicle  
other

**4. How frequently have you used a PT vehicle in last few months?**

Once a day  
Twice a day  
Once a week  
3 to 5 times a week  
Once a month  
3 to 5 times a month  
More than 5 times a month  
Never

**5. What does your daily or weekly routine consist of?:**

going to work  
going to school, faculty  
visit to a physician  
visiting relatives or friends  
recreation  
attending events  
events

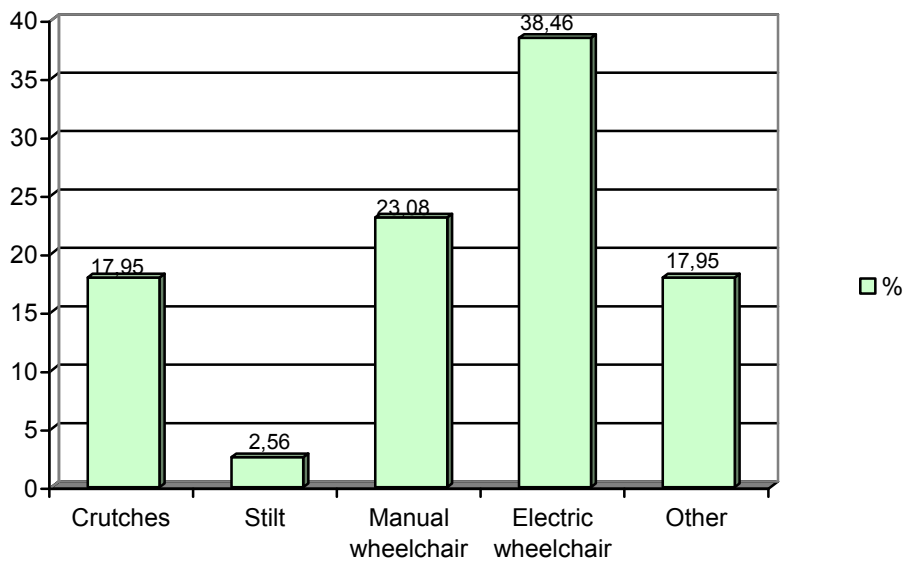
**6. List the most frequent itineraries (taken by PT, taxi or by your organization's vehicle) you've used in last three months.**

**7. According to your opinion what are improvements needed for better PT service?**

vehicles more adapted to needs of disabled  
more bus stops  
more frequent rides  
drivers with special training in assisting disabled  
more information on possible ways to get real arrival time of PT vehicles  
other



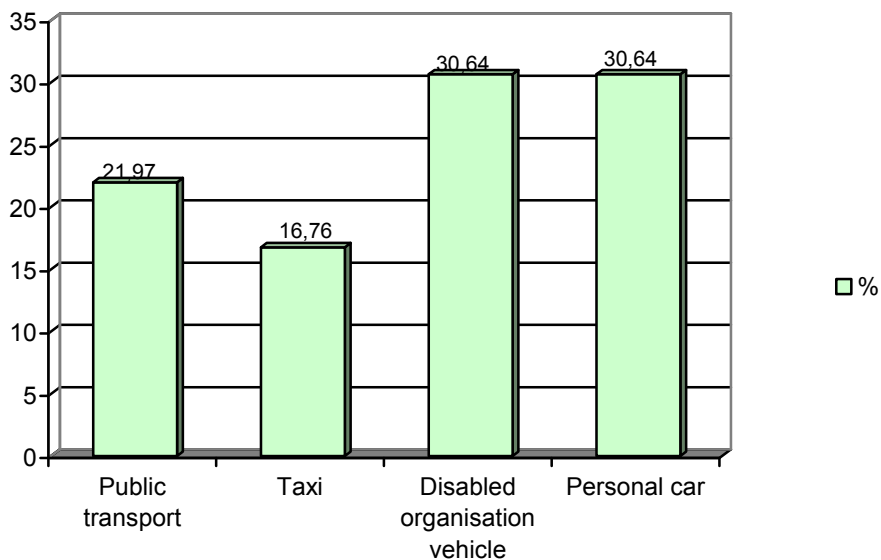
### 3. Aid or means for walking/ moving



- 38,46 % use an electric wheelchair
- 23,08 % use a manual wheelchair
- 17,95 % use crutches
- 17,95 % use a white pole for blind persons.
- 2,56 % uses stilts

### 6. What mean of transport do you usually take for your daily routine (graduate from 1 to 5)?

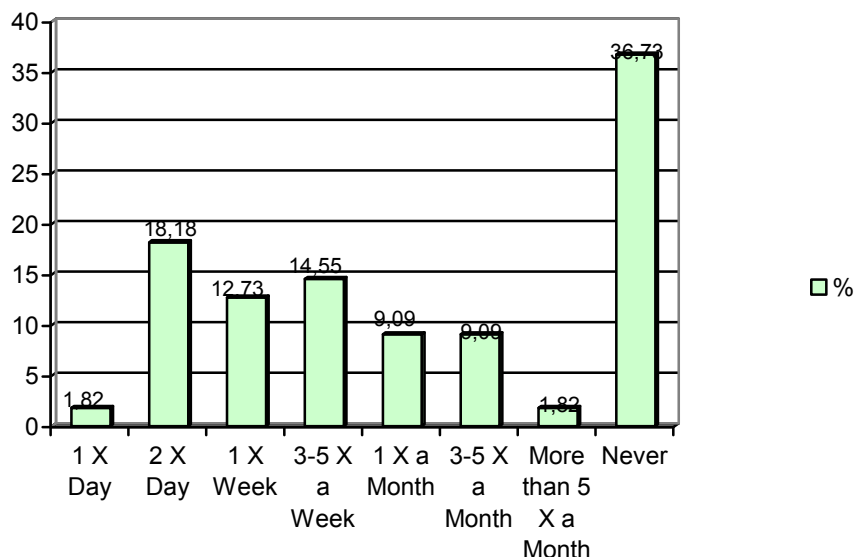
5 – always; 4 – frequently; 3 – from time to time; 2 – rarely; 1 – never



It is clear that persons that have taken part in the questionnaire for their daily mobility routine most frequently use either the vehicle of their organization or their personal car (both exactly

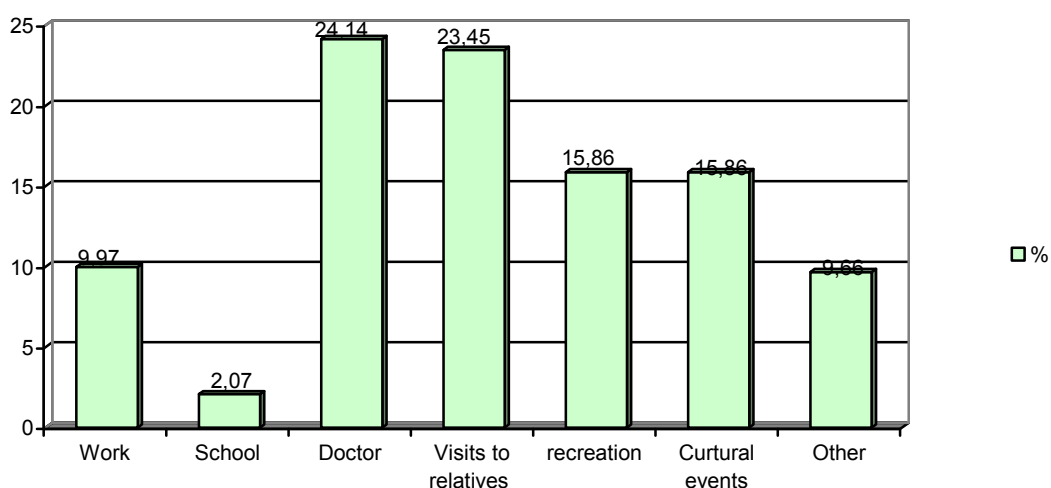
30,64%). The questionnaire has at the same time shown that organizations of disabled take good care of mobility needs of their members (by cars and vans). PT is most frequently used by students with disabilities and by deaf or blind people (21,97%). 16,76% persons in question most often use a taxi for their daily or weekly trips.

**7. How often have you used PT in the last few months?**



PT is almost not used by elderly disabled persons while students, blind and deaf people use PT quite frequently. As much as 36,73% of the respondents (mainly persons older than 45 years) answered that they never use PT as they use either a vehicle of their organization or their personal car. 18,80% of respondents use PT twice a day (employed, students).

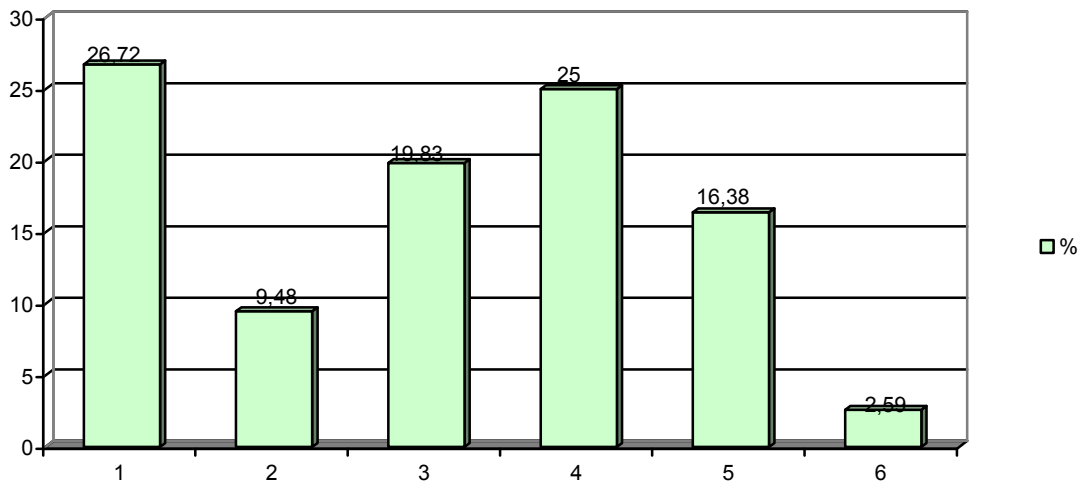
**8. What are your daily or weekly obligations?**



9,07 % surveyed persons are using PT for their route to work; 2,07 % for their route to school; 21,14% for visiting the doctor; 23,45% to visit friends or relatives; 15,68% for recreation; 15,86% for cultural events and 9,66% for other.

**10. What kind of changes/improvements are in your opinion needed to improve PT service (3 possible answers)**

1. Adequate vehicle equipment suitable for disabled persons
2. Network of bus stops spreading
3. More frequent rides,
4. Adequate driver qualifications
5. Information about adequate bus type approaching bus stop
6. Other



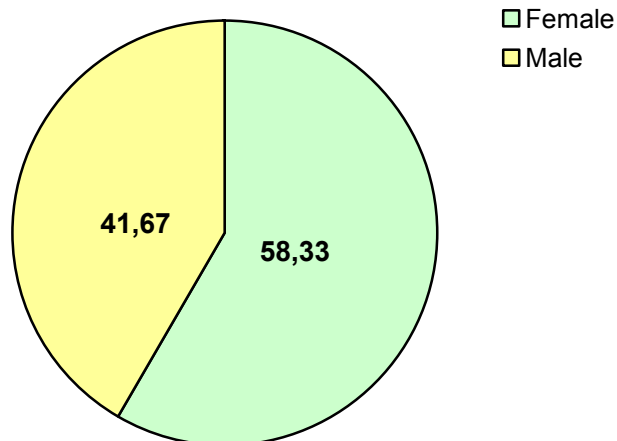
As regards “Other” (2,59%) the people mentioned the possibility of entering with electrical wheelchairs. 26,72% have the opinion that an improvement of PT service vehicle is essential. 19,83% have the opinion that PT service can be approved by increasing the frequency of PT service.

### 8.3. Appendix 2 – Analysis of short survey: Travelling habits of disabled people in Ljubljana

In January 2010 the City of Ljubljana's Developments and Investments Office conducted a survey on the travelling habits of disabled people in Ljubljana for LPP to be able to reach objectives planned within measure 6.1-LJU Demand responsive services. Altogether, 164 questionnaires were filled in and evaluated.

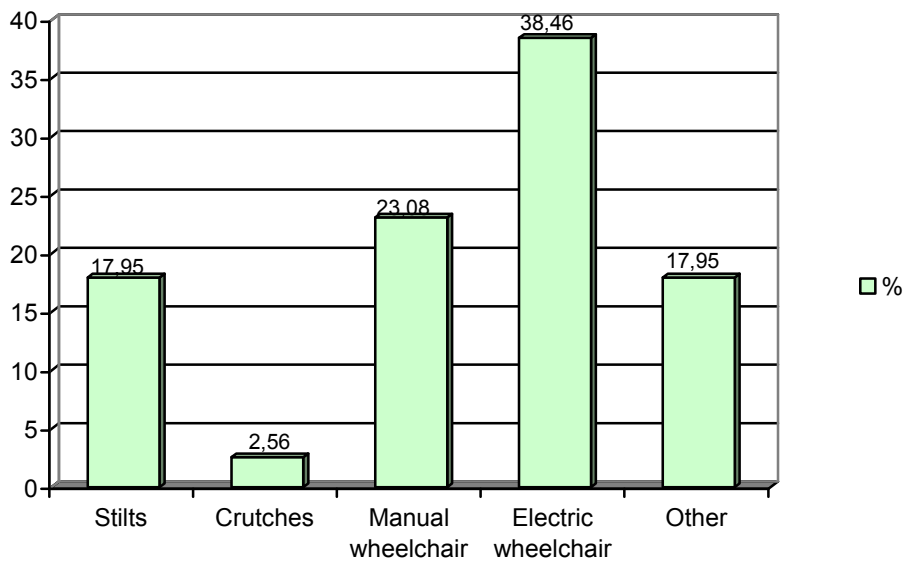


In the survey 58,33 % of the participants were female and 41,67 % male.



Female (green) ; Male (yellow)

## Aids for overcoming disabilities

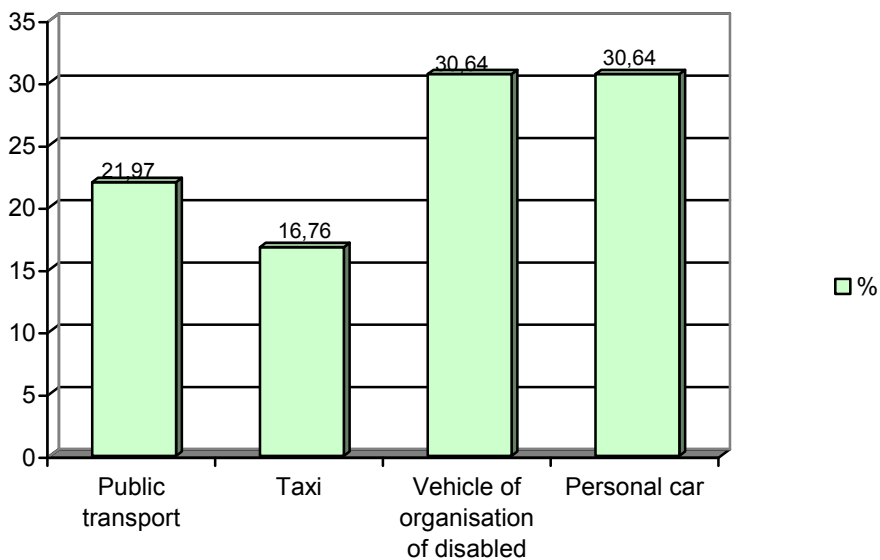


- 38,46 % of respondents are using an electric wheelchair.
- 23,08 % of respondents are using a wheelchair.
- 17,95 % of respondents are using crutches.
- 17,95 % of respondents are using a white stick.
- 2,56 % of respondents are using stilts.

## Travelling habits

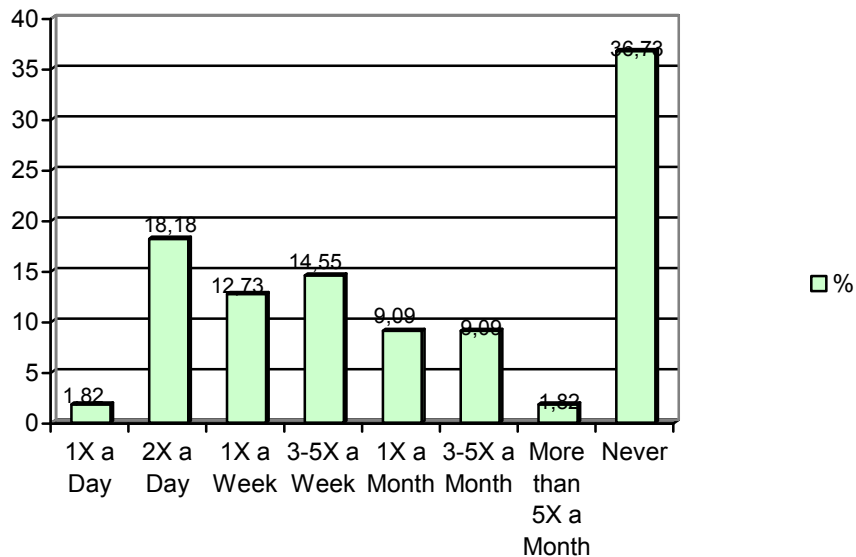
**Which kind of transport do you use on a daily basis (estimate 1 to 5):**

5 – regularly; 4 – often; 3 – sometimes; 2 – rarely; 1 – never



- The graph shows that the surveyed group is using a van of their own organisation (30,64 %) and car (30,64 %). Disabled people's organisations have well organised transport for their members (vans, cars).
- Public transport is mostly used by disabled students, blind and deaf (21,97 %).
- 16,76 % of respondents are using taxis for their transport needs.

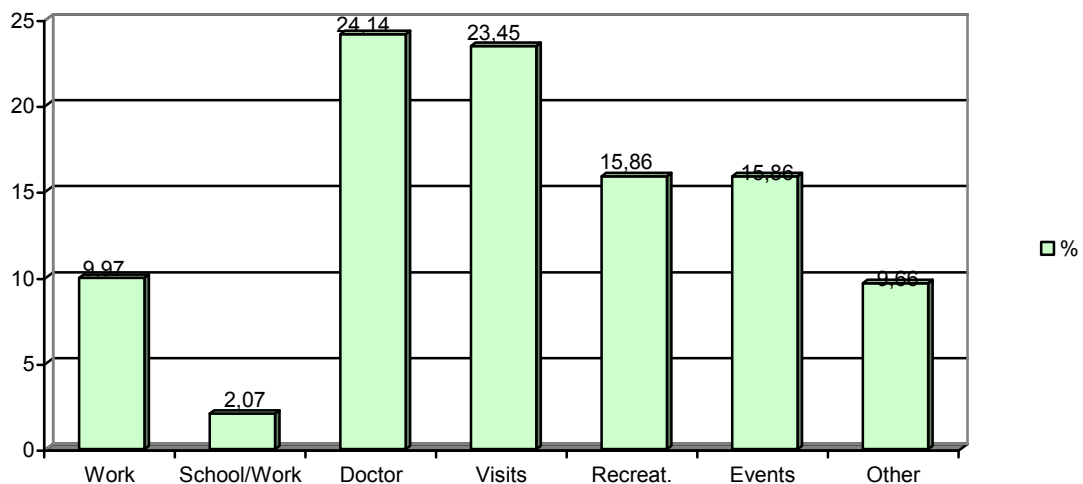
**How often did you use public transport in the last months?**



Older disabled people almost never use public transport, on the other hand students and senior disabled use public transport very often.

- 36,73% respondents answered that they never use public transport (above 45 years) because they use cars or vans.
- 18,18 % respondents are using public transport twice a day (employed and students).

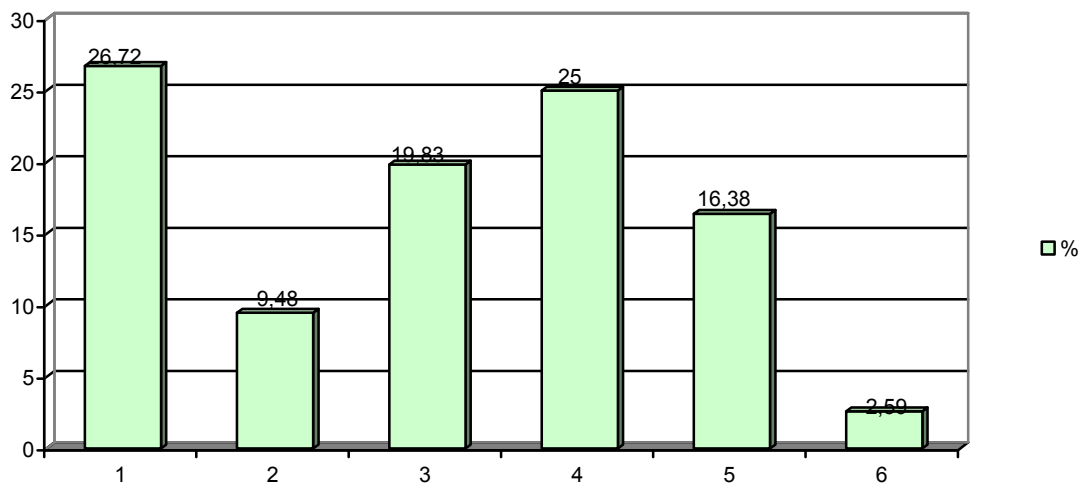
**What are your daily or weekly obligations?**



- 24,14 % respondents answered, daily or weekly to visit the doctor.
- 23,45 % respondents answered, daily or weekly to visit friends and relatives.
- 15,86 respondents answered, daily or weekly for recreation or cultural events.
- 9,66 % respondents answered, daily or weekly for shopping and other.

**How should public transport services be improved? (3 possible answers)**

1. appropriate adaptation of vehicle's equipment for the disabled
2. wider network of bus service
3. more frequent service
4. adequate driver's qualification to support disabled passengers
5. Information about possible deviations from published timetables
6. other



- under 6 (other) 2,59 % of respondents asked for the possibility to enter the bus with electric wheel-chairs.
- 26,72 % of respondents answered that the improvement of public transport vehicles' equipment is essential to improve public transport services.
- 19,83 % of respondents answered that the public transport can be improved by more frequent service.

General comments from respondents:

1. Drivers are not sufficiently qualified to operate the for ramps for wheelchairs
2. Advertising boards represent obstacles for the disabled (wheelchair, blind, etc.).
3. Obstacles preventing cars from parking often makes leaving the bus very difficult.
4. Organisations for the disabled have well organised transport.
5. Organisations for the disabled have their own vans.
6. There is no boarding ramp at the first door.
7. Drivers are very friendly and helpful.
8. Buses on lines 6, 8 and 11 should have ramps (mostly line 11)
9. Students use public transport regularly every day for trips to school and back.
10. Croatia has free transport for the disabled with buses and trams.
11. Drivers should turn on announcement equipment.
12. Buses should drive directly to disabled organisations.
13. Better connections with line 25.
14. Connection with line 25 – bus stop is too far.
15. Extension of lines 25 and 12 to club headquarters.