EUROPEAN COMMISSION

DG RESEARCH

SIXTH FRAMEWORK PROGRAMME

THEMATIC PRIORITY 1.6

SUSTAINABLE DEVELOPMENT, GLOBAL CHANGE & ECOSYSTEMS

INTEGRATED PROJECT – CONTRACT Nr. 031315

Trondheim cybercars showcase report

Deliverable no.	D.1.5.1.5
Dissemination level	Public
Work Package	WP 1.5.1: Studies and demonstration management
Author(s)	Carlos HOLGUIN, Adriano ALESSANDRINI
Co-author(s)	
Status (F: final, D: draft)	Fin_06.04.2011
File Name	CITYMOBIL_D.1.5.1.5_Trondheim_Showcase_report_Final.doc
Project Start Date and Duration	01 August 2006 - 30 April 2011

TABLE OF CONTENTS

TABLES

FIGURES

Executive summary

The objective of the CityMobil project is to achieve a more effective organisation of urban transport, resulting in a more rational use of motorised traffic with less congestion and pollution, safer driving, a higher quality of living and an enhanced integration with spatial development. This objective is brought closer by developing integrated traffic solutions: advanced concepts for innovative autonomous and automated road vehicles for passengers and goods, embedded in an advanced spatial setting. The city of tomorrow is in need of integrated traffic solutions that provide the required mobility in an efficient, safe and economic manner. It is inevitable that automation, in all possible forms between providing information at one end of the spectrum and fully autonomous driving at the other, will play a major role.

At three sites: Heathrow, Castellón and Rome, large scale demonstrators are being set up to supply proof of concept of innovative transport systems integrated in the urban environment.

Alongside with the three demonstrations CityMobil investigates the effects of the advanced transport solutions on urban areas through modelling and small scale demonstrations limited in size and time called showcases.

Two typologies of showcase vehicles are made available in the CityMobil framework: advanced city cars and cybercars. The showcase organised with the first typology of vehicles aims at demonstrating how enhanced manoeuvrability (i.e. safe turning around tight corners in narrow streets), automated access/exit from parking, and platooning can make car-sharing service cheaper and more attractive through easier vehicle relocation and enhanced accessibility. The cybercar showcase aims at showing how fully autonomous road vehicles can be effectively used in public transport, especially in low to medium demand areas and periods, to make the public transport service more reliable and frequent where conventional collective public transport cannot meet the mobility needs of the population in a environmentally and economically sustainable manner.

Many European cities expressed their interest in investigating, either through modelling or through showcases, the possibility of addressing some of their mobility problems through these advanced transport solutions.

Trondheim was the third and last cybercar showcase to be executed under the CityMobil project. A cybercar showcase, alongside a conference and an exhibit prepared in conjunction with the CityNetMobil project, was held in August 2009 and this deliverable reports on its results.

1 Introduction

The objective of the CityMobil project is to achieve a more effective organisation of urban transport, resulting in a more rational use of motorised traffic with less congestion and pollution, safer driving, a higher quality of living and an enhanced integration with spatial development. This objective is brought closer by developing integrated traffic solutions: advanced concepts for innovative autonomous and automated road vehicles for passengers and goods, embedded in an advanced spatial setting. The city of tomorrow is in need of integrated traffic solutions that provide the required mobility in an efficient, safe and economic manner. It is inevitable that automation, in all possible forms between providing information at one end of the spectrum and fully autonomous driving at the other, will play a major role.

At three sites: Heathrow, Castellón and Rome, large scale demonstrators are being set up to supply proof of concept of innovative transport systems integrated in the urban environment.

Alongside with the three demonstrations CityMobil investigates the effects of the advanced transport solutions on urban areas through modelling and small scale demonstrations limited in size and time called showcases.

Two typologies of showcase vehicles are made available in the CityMobil framework: advanced city cars and cybercars. The showcase organised with the first typology of vehicles aims at demonstrating how enhanced manoeuvrability (i.e. safe turning around tight corners in narrow streets), automated access/exit from parking, and platooning can make car-sharing service cheaper and more attractive through easier vehicle relocation and enhanced accessibility. The cybercar showcase aims at showing how fully autonomous road vehicles can be effectively used in public transport, especially in low to medium demand areas and periods, to make the public transport service more reliable and frequent where conventional collective public transport cannot meet the mobility needs of the population in a environmentally and economically sustainable manner.

Many European cities expressed their interest in investigating, either through modelling or through showcases, the possibility of addressing some of their mobility problems through these advanced transport solutions.

Trondheim was the third and last cybercar showcase to be executed under the CityMobil project. A cybercar showcase, alongside a conference and an exhibit prepared in conjunction with the CityNetMobil project, was held in August 2009 and this deliverable reports on its results.

Trondheim site description and reasons for selection are in section 2 of this report.

The showcase execution is described in section 3 and its evaluation in section 4. Finally section 0 reports on the press coverage and dissemination.

2 Trondheim city and site description and reasons for selection

The city of Trondheim represents a major centre and an important transport node in the Sør-Trøndelag region. Trondheim has a population of approximately 160 000 inhabitants. The surface of the city centre, which is a "heart" shape surrounded by the Nid river, has a surface of approximately 1000 by 1000 m.

2.1 Trondheim mobility situation and plans

The car ownership rate among city centre residents is rather low. 74% of trips are done by individual modes of transport and 26 % are done by public transport. The on-street paid parking is evenly distributed, while parking garages are located somewhat at the periphery of the central shopping area and in the most attractive office areas. Due to the road network configuration, every quarter has only a few access options. The hotels rely mostly on public parking.

Concerning public transport, there is a bus terminal in the city centre, alongside a main street, and 2 more at the harbour and the railway station. The public transport serves two corridors, one east west and one north south, and these include 6 intermediate bus stops altogether inside the heart.

The overall objective of Trondheim's transport strategy is to develop a transport system that offers high accessibility for all citizens, decreases external environmental effects and enhances the quality of life. Some of the selected instruments are: priority to environmental friendly transport in city centre, competitive public transport services, safe transport, and efficient and low polluting freight transport.

Out of 3 issues to be dealt with[1], the City decided to investigate the cybercars application in Single Purpose Sub-centres. Trondheim has a number of sub-centres that represent a major challenge for mobility. The university campuses are dispersed over a major area, representing a significant transport demand for students, visitors and employees. The major shopping area outside the city has many superstores with separate parking areas. The area is approximately 1 km long, and there is a significant volume of internal traffic between the superstores and the parking facilities. Finally, the hospital building area, which is undergoing a major renovation work, will be spread over a larger surface than previously. The city exhibition area is located nearby the hospital. The road network between these poles has a low capacity, and is surrounded by a large number of private houses and blocks of flats. Both patients and relatives will need guidance to move around this complex buildings structure. Parking areas will be scarce, making a park-and-ride solution necessary. The challenges of these projects have much in common with the Rome and the Heathrow demonstrators.

2.2 Reasons for selection

The selection process was based on questionnaires completed by the Reference Group member cities. These questionnaires were analyzed using the MAESTRO methodology, in order to determine the feasibility of the execution of the showcase, as well as its potential impact (GEA, 2007). At the moment of the selection process, only 2 cybercars showcases were going to be executed. However, Work package 1.5's benefited from a budget shift in 2007 and the organization of a third cybercars showcase was therefore decided.

In the initial selection process, Trondheim was ranked in the 6th position out of 6 candidates. However, since one showcase was already going to be organized in Italy (Genoa), the 2nd and 3rd positioned cities (Santa Margherita Ligure and Orvieto Ciconia) were dismissed in order to guarantee the geographical distribution of the project's activities. The candidate

[1] DITS, ITS, Elvestad, Birger, *Questions for Site Selection, Trondheim*,

ranked in 4th positioned, Hyvinkää, declined to organize the showcase, and it was replaced by the city of Vantaa (HOLGUIN ET AL., 2009). Finally, the candidate ranked in the 5th position, Almere, declared to be interested in PRT rather than in cybercars and also declined to organize a cybercars showcase. Trondheim being the only candidate left, a site visit was organized to assess the technical feasibility of a showcase and the impact it could have at a long term. Three sites were presented to the project partners.

The objective in the first potential site was to link the harbour to the city centre. A canal separates these two areas, and the only passage is through a small two-way bridge. This causes a strong congestion as truck and private car traffic has to cross the city centre. The new ring road (opened in 2009) was designed to solve the through traffic problem, but the city wanted to improve the mobility for commuters and tourists who come from the harbour. The distance between the harbour and the major attraction point, the Nidaros Cathedral, is about 1,8 km. The tourists coming in the coastline ships have only a very small timeframe (3 hours) to visit the city, and the walk to the Cathedral takes the most of it. The harbour is also a strong attraction point with office buildings, a pool complex, a research centre and, in the near future, a hotel and a conference centre. The city planed to build a new bridge only for pedestrians and cyclists to shorten the link between the city centre and the harbour. This bridge could be adapted to an automated shuttle service for commuters and tourists. Even if this distance may be short depending on the destination, the harsh local weather conditions may discourage tourists from visiting the city.

The second site is the city centre itself. The major part of the commercial activity is concentrated in a pedestrian area. This area will be extended and closed to all private car traffic (in the end it will be around 0,6 by 0,6 km). With the extension of the pedestrian area, the municipality plans to create a hub for all the city buses next to the pedestrian zone. The 30 years old tramway line should also be extended (100 m) to connect it to the hub. The extension of the pedestrian area will increase the walking distance from parking lots. Walking in the area, in heavy winter conditions, can discourage people from strolling all through the commercial area, making conditions for commerce difficult in the areas far from the parking spots or from the bus hub. This might also generate pick-up and drop-off traffic around the pedestrian zone. The distribution of goods is also a problem to be solved with the extension of the pedestrian area. A solution might be a hub to collect goods from lorries and then distribute them with no polluting (automated or not) vehicles.

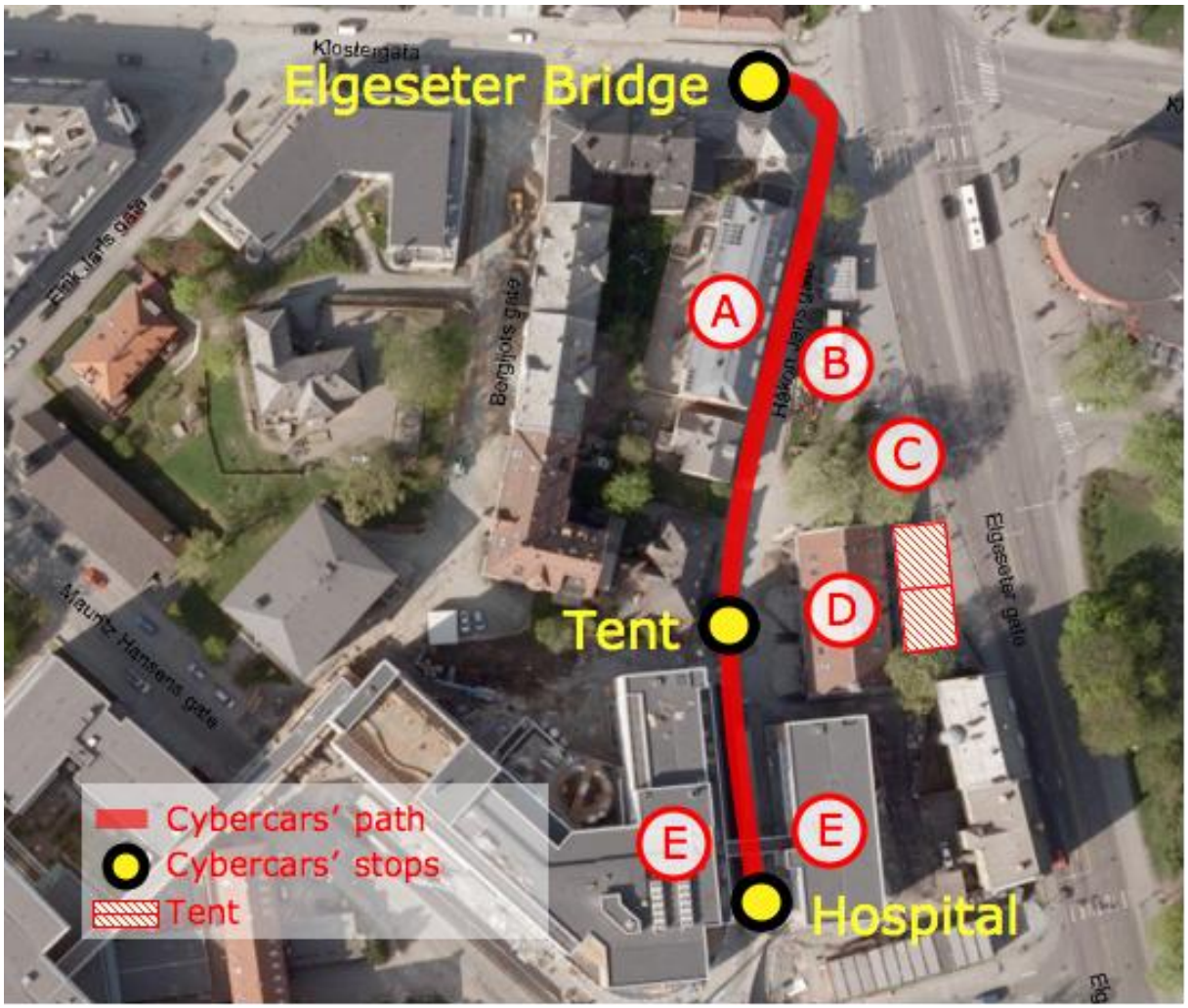
The third site that might be served by an automated shuttle is the hospital renewal project, which occupies a surface of around 600 by 400 m. This hospital will only provide a small parking area for employees, and a new parking area is planned across the Nidelva River, in replacement of a train depot. A small two-way bridge that currently supports very little traffic links the two areas. The whole hospital and parking area will be closely linked to the future ring road, bringing a big portion of traffic to the Hospital. Therefore, the municipality considers linking the parking area to the Hospital with an automated shuttle service across the bridge. This would be the only service allowed inside the hospital area. The system might be partly financed by the Hospital, which is said to be the highest investment in the mid-Norway area ever. The longest linear distance between the extremes of the parking and the hospital entrance is about 0,5 km.

The positive results of the site visits, with several different applications for cybercars, and the commitment shown by the local consortium, formed by the City and the Regional administration, the Regional Hospital and the National Road Administration, motivated the decision of selecting Trondheim as the Third showcase site. The site that was finally selected for the showcase execution was the Third option, the Hospital area site.

2.3 Site description

The site selected for the execution of the showcase is Håkon Jarls gate. The street is located in the area of the Hospital, right outside the city centre on the main access road to the “heart” of the city centre from the south (Elgeseter street). Håkon Jarls gate is a small pedestrian and cyclist street that connects a bus stop on Elgeseter street to the Hospital area. The site was selected due to the large amount of passers-by. The pedestrian and bicycle traffic is concentrated in peak hours, from 8 to 9 AM and from 2 to 4 PM.

Figure 1. Showcase site map



A. Houses and stores; B. Park; C. Bus stop on Elgeseter street; D. Grocery store and Driving school; E. Hospital buildings.

The track had a length of 170 m, and 3 stops were made available: one at the south end of the track (“Hospital”), another one near the bus stop (“Tent”) and a last one near the Bridge (Elgeseter Bridge). Due to the narrowness of the track, which prevented the vehicle from making a U-turn, it was decided that the vehicle would follow a linear path, moving backward and forward on the same trajectory, like a horizontal lift. Barriers to prevent cyclists from riding in the cybercars path surrounded most of the track. Staff from the local consortium managed the gaps in the barriers, which were left open for pedestrian crossings and to give access to the houses or stores in the area. This started at the same time as the showcase vehicles were setup.

A park with a triangle shape is located between the bus stop on Elgeseter street and Håkon Jarls street. This park was undergoing renewal works by the time of the last preparation visit to the site in March 2009. The City informed that the works would end up in June, before the showcase started. However, when the showcase team arrived, the works in the park had not been finalized, and the park was completely surrounded with fences 1,8 m high. This reduced the showcase vehicle's visibility from Elgeseter street, from where most of the public for the showcase should come from. Figure 2 shows a general view of the showcase site with the fenced park. This park was completely opened exactly the day when the showcase was dismantled, although a part of it was opened for cyclists' circulation before the end of the showcase.

Figure 2. View from Elgeseter street towards the tent and the park

In order to explain to the public the goals and benefits of the use of cybercars in urban transport, the Trondheim showcase featured an exhibit, designed by the CityNetMobil project, which comprised posters, videos, a Café terrace for the public to fill the showcase survey questionnaires and a dedicated area for the City to exhibit its plans concerning cybercars. All this material was translated to Norwegian language to make it accessible to the local audience. The exhibit was displayed inside a tent of 15 x 10 m surface and 4 m height. A separate area of 10x5 m was used for maintaining and recharging INRIA's vehicles. Due to the lack of space in the site, the tent exhibit, which should have been installed at one of the cybercars' stops, had to be installed at a few meters away from the cybercars track.

2.3.1 Site modifications

Some information about the traffic in the site, unknown during the showcase site selection and preparation, had to be managed when the showcase setup started. The first issue was the deliveries to the Convenience store (C in Figure 1), done by truck 3 times per week. These trucks had to park right in front of the "Tent" stop. The second fact is that a Driving school is located in the same building as the grocery store. The Driving school's cars had to use the same street than the cybercars two times per hour. This was managed by placing one of the local partners' staff by the north end of the track (near the "Elgeseter Bridge" stop), linked by radio to the person in the "Tent" stop. Both persons had to inform each other when a car from the driving school or a delivery truck had to enter the track, in order to stop the cybercar until the car or truck had passed.

Since Håkon Jarls street is part of a bike path used daily by tens of cyclists, an alternative bike path had to be designed. This was done during the showcase setup, and although it was difficult to find an arrangement that coped with the cyclists, pedestrian and commercial traffic in the area, the local consortium was very efficient in installing signs and staff to control the different traffic flows. However, after the showcase opened, a person in the local road administration requested that the fences closing the track across the park be removed, so that the cyclists could use it. Since this affected the localisation system of the vehicle, based on the recognition of the environment, the showcase operation was interrupted preventively for one morning in order to adjust the cybercars' guidance system.

2.4 Tent exhibit

As explained above, an exhibit designed by the CityNetMobil project, was presented during the Trondheim showcase. The exhibit represents a "Street of the future", where all kinds of transportation systems (including cybercars) share the public space with pedestrians and cyclists. Figure 3 shows a 3D image of the exhibit. Due to the small space available in the site for the tent, the size of the regular exhibit (20x12 m) was reduced to 15x8 m.

Figure 3. 3D image of the CityNetMobil exhibit

The City provided the urban furniture presented in the exhibit: 2 benches, 1 bike rack, 5 terrace tables and 15 chairs. The tree was provided by the CityNetMobil project. Figure 4 and Figure 5 show pictures of the interior of the exhibit.

Figure 4. View of the CityNetMobil exhibit

Figure 5. View of the CityNetMobil exhibit

A series of posters and a video were made for this exhibit. All the material was translated in Norwegian language. The posters and the video are included as an annex.

3 Showcase execution

The site and vehicle setup were done from August 18th until August 24th 2009. The setup took a long time because, due to the configuration of the site, the GPS guidance could not be

used, and a new guidance technique had to be prepared. Several events were organized in parallel in order to advertise the showcase among the public. A press conference was organized on August 25th. A conference titled *A driverless future*, directed mostly to Norwegian urban planners and transport specialists, was organized on August 25th and 26th. The programme of this conference included a visit to the showcase. Since the conference venue was distant about 1 Km from the showcase site, the transport of the assistants to the conference was done using hybrid buses provided by the city. The showcase public operation started on August 25th and ended on August 30th. Some 20 assistants to a conference on ITS and Road safety, organized by the National Road Administration, also visited the showcase.

The showcase operation represented an on-demand cybercar service over a line, with 3 stops linked by a single path over which the vehicle ran back and forth, as shown in Figure 1. The users had the possibility to choose between the different destinations on the vehicle's touch screen. When the destination was selected and confirmed, the vehicle travelled non-stop to the selected destination. Before starting the trip, the users were also requested to indicate the number of passengers per trip. This data was recorded in a log file to produce statistical information about the use of the vehicles during the showcase. During the trip, an audio recording explained the function of the vehicle in Norwegian language. At the end of the trip, a recording requested the passengers to visit the tent in order to answer the survey. 133 persons completed the survey.

Since only one of INRIA's vehicles is closed, and because of weather considerations, this was the only vehicle showcased. However, this vehicle has a capacity of 6 passengers, which compensates the fact of not having several (2 passenger) smaller vehicles.

Safety incidents during the operation

Despite the modifications made on the site at a late stage, as indicated in paragraph 2.3.1, no safety incidents occurred during the showcase setup or operation.

4 Evaluation of users reaction to the showcase

4.1 Indicators

In the Trondheim showcase all the Acceptance indicators ("usefulness", "ease of use", "reliability", "user satisfaction for the on demand system" and "integration with other systems"; "user willingness to pay") and also four out of six Quality of Service indicators (perceived comfort", "perceived level of privacy", "perception of safety" and "fear of attack") were measured in the ex-post survey through specific questions. Also an indicator belonging to the Social impacts was investigated, the "access times for mobility impaired users".

Moreover, an open question was inserted in the questionnaire where the interviewed people were asked to comment on their experience and express free opinions ("What are the reasons for fear to use CyberCar? What kind of requirements for traffic safety should be carried out? What other kind of improvements should be done?"). The answers were structured and related to the standard indicators in order to confirm or disprove the score they got with the questionnaire.

All the scored indicators were obtained in terms of **importance** and **performance**, except two of them ("user willingness to pay", "access times for mobility impaired users"), for which the importance was not investigated.

The whole situation is reported in the following Table 1. The surveyed indicators are marked with a "✓".

Evaluation Category	Impact	Indicator	Importance	Ex-post performance rating
Acceptance	User acceptance	Usefulness	✓	✓
		Ease of use	✓	✓
		Reliability	✓	✓
		User satisfaction for the on demand service	✓	✓
		Integration with other systems	✓	✓
	Willingness to pay	User willingness		✓
Quality of service	Information	Availability		
		Comprehensibility		
	Comfort	Perceived comfort	✓	✓
	Privacy	Perceived level of privacy	✓	✓
	Perception of safety and security	Perception of safety	✓	✓
		Fear of attack	✓	✓
Transport patterns	System performance	Average journey time		
Social Impacts	Service accessibility	Access (times) for mobility impaired users		✓

Table 1 Indicators dealt in the user acceptance survey of the Trondheim showcase.

"✓"= indicator quantified through specific question;

= availability of comments from answers to open question;

= no rating available

To summarize, the interviewed persons were submitted to a set of 15 questions, subdivided as follows:

- 7 questions were related to the evaluation of the system: 4 of these referring to the system **performance**, 3 to the **importance** to be given to the different performance indicators
- 3 questions dealt about the users habits
- 5 questions were related to the users main characteristics (age, gender, education, occupation, income). These provided the opportunity to analyze the answers by distinguishing different user profiles.
- finally, the users were given the possibility to express with free words any comment on their experience with the ATS

Totally, 11 indicators were quantified, while the free answers were reported to 7 indicators, of which 5 in common with the scored ones and 2 extra, but still belonging to the global reference set.

4.2 Results

A total of 133 interviews was performed.

In the following Figure 6, Figure 7, Figure 8, Figure 9 the distribution of the sample is shown, according the different available characteristics of the interviewed people (age, education, occupation, income).

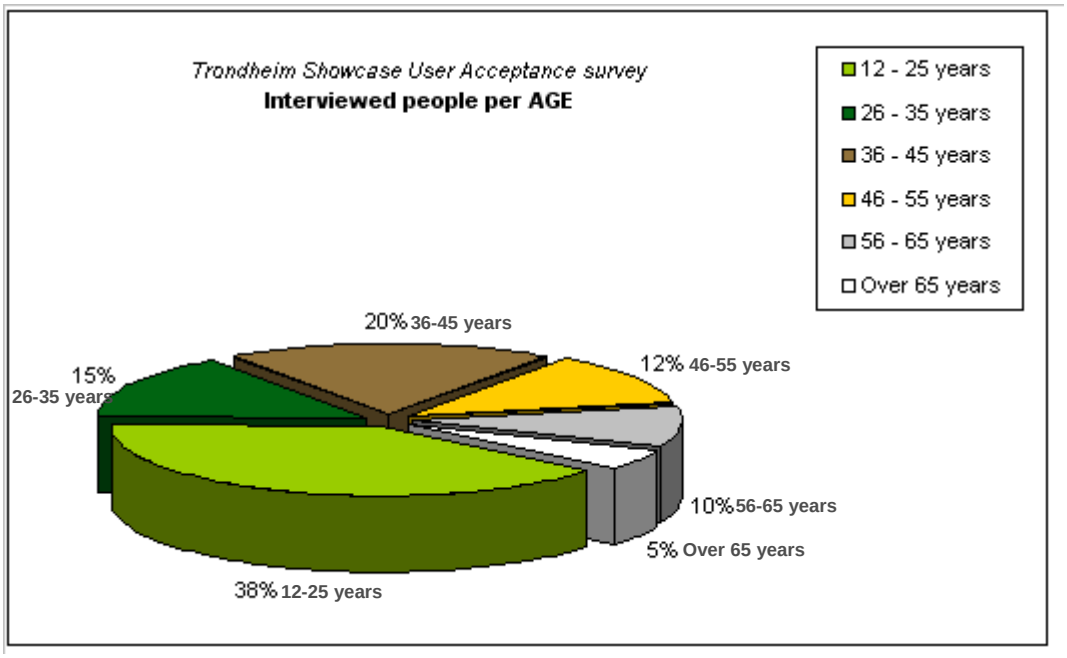


Figure 6 Trondheim interviewed people divided per age

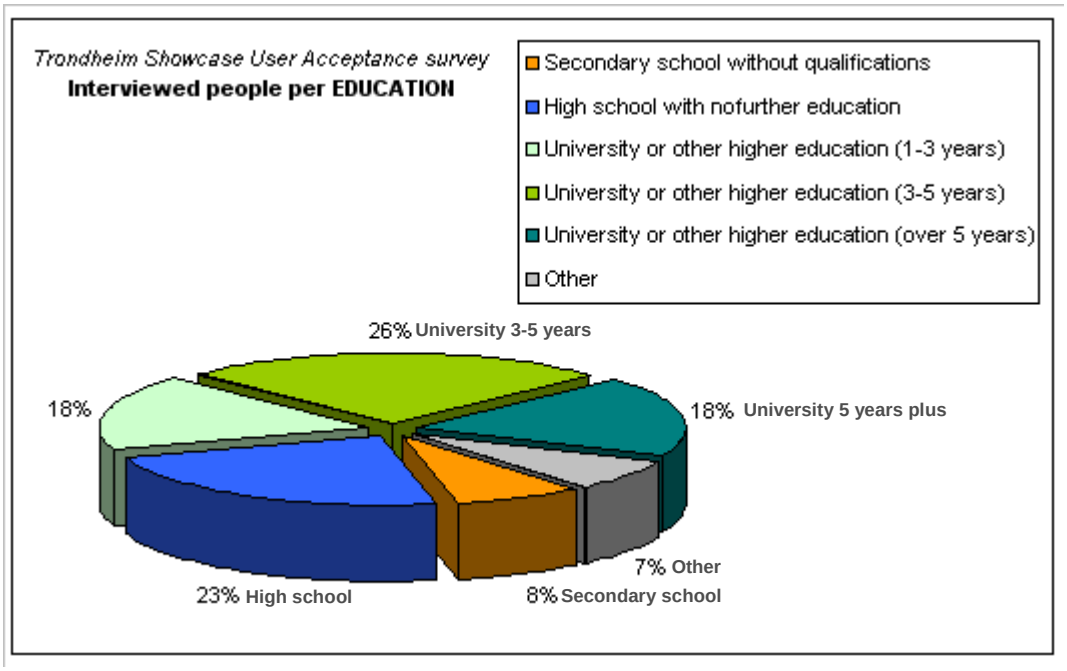


Figure 7 Trondheim interviewed people divided per education

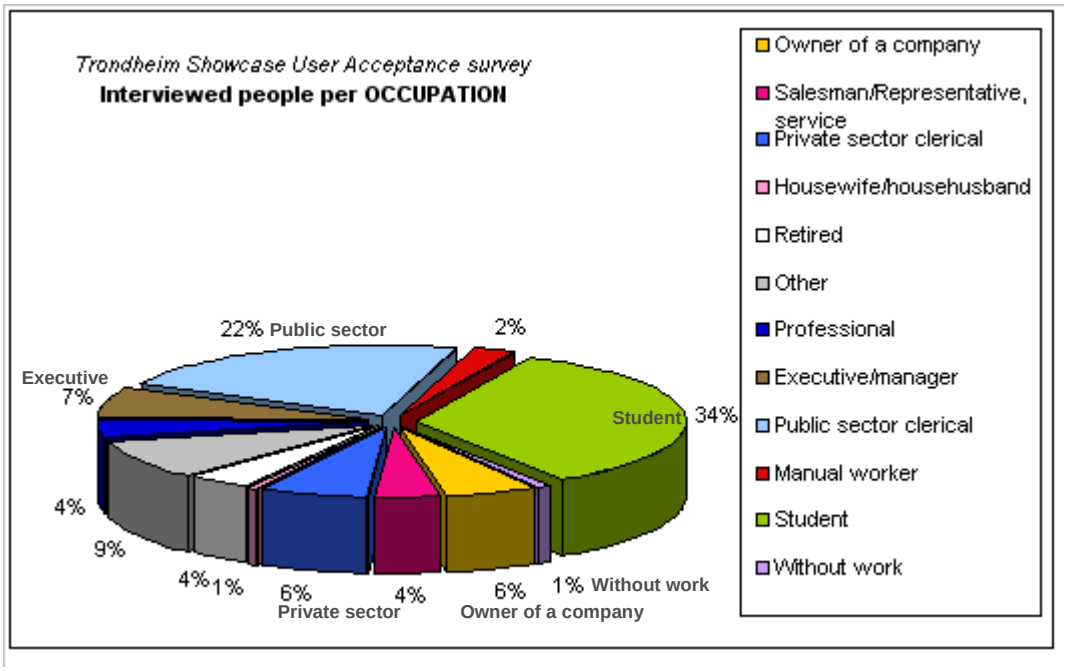


Figure 8 Trondheim interviewed people divided per occupation

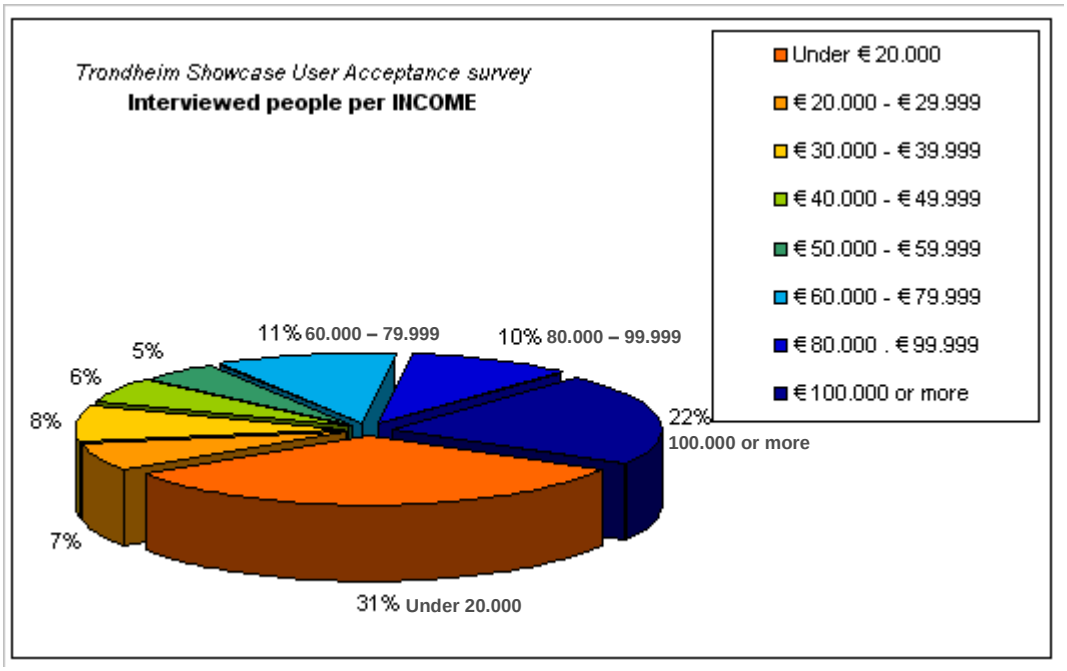


Figure 9 Trondheim interviewed people divided per income

The following Table 2 reports the ratings averaged on the whole interviewed population. The numbers reported on the table have the following meaning:

- as for the **importance** values obtained for the different indicators, collected in terms of order of importance (1=maximum importance), the average value was provided simply averaging the rating of the single answers; it is important to notice that the scores in this case have no general value, instead they are “levels of importance” referred to the specific Evaluation Category only;

- as for the **performance**; in this case the numbers have the meaning of a score average (1 to 5) being 1 completely dissatisfied with the system performance compared to conventional public transport systems and 5 completely satisfied;
- for the indicators that were also assessed through answers to the **open question**, the results were summarized in the table (blue cells).

Evaluation Category	Impact	Indicator	Importance (1=most, 5=less)	Ex-post performance rating
Acceptance	User acceptance	Usefulness	3.0	3.1/5
			4 respondents complained on Usefulness. 2 of these complained about no possibility of bringing luggage	
		Ease of use	2.8	3.5/5
			1 person complained on ease of use	
		Reliability	2.6	3.2/5
		User satisfaction for the on demand service	3.3	3.5/5
		Integration with other systems	3.2	3.1/5
	Willingness to pay	User willingness		1 to 2€
Quality of service	Information	Availability	3 respondents complained about Information Availability. 2 of these suggest to provide travel information on board	
		Comprehensibility		
	Comfort	Perceived comfort	2.6	3.7/5
			9 respondents complained about Perceived Comfort. 4 of these complained about uncomfortable driving style 3 of these feel the cab is too narrow	
	Privacy	Perceived level of privacy	3.1	3.1/5
	Perception of safety and security	Perception of safety	1.7	3.5/5
			22 respondents are concerned about Safety 10 of these are concerned about collision with other traffic (need for separate lane, reliable sensors, reliable breaking system) 4 of these are concerned with travellers protection, complained about the absence of safety belts	
		Fear of attack	2.5	3.7/5
Transport patterns	System performance	Average journey time	29 respondents complained about slow speed	
Social Impacts	Service accessibility	Access (times) for		83%

		mobility impaired users	11 respondents consider the system as non suitable for mobility impaired users

Table 2 Average values for indicators dealt in the User acceptance survey of the Trondheim showcase

Looking at the results both in terms of **weight** and **performances** the average ratings show the following:

- Within the “Acceptance” evaluation category, Reliability results to be the most important indicator, with an average position of 2.6 (1 = “most important”, 5 = “less important”). The performance on this indicator was rated in average as quite good (3.2/5), although higher scores should be targeted on this aspect. Travellers felt in average that the less important aspects are instead the integration with other transport systems (average rate = 3.2) and the on demand service performance (3.3). However both the indicators were scored quite positively (3.1/5 and 3.5/5). Concerning the integration, the result suggests that users may perceive the ATS as a stand-alone system rather than part of the whole public transport service driving them from home to the hospital; this is quite surprising considering that in the configuration they experienced the cyber cars would carry persons from a bus stop (Studentersamfundet) to their final destination; as for the satisfaction with the on-demand service, the rather low rating as for its importance is counterbalanced by a fairly good score on its performance (3.5). This aspect apparently did not represent an issue for travellers. Ease of use and usefulness lay in the middle as for importance within this evaluation category. The performance got a passing score for usefulness (3.1/5), although in the open question some passengers complained especially about no possibility of bringing luggage on the cab; for the ease of use indicator the score was fairly good (3.5/5) and no issues were raised in the open question either.
- Within the “Quality of service” evaluation category, a great importance is given by the respondents to safety. The weight was rated with an average 1.7 and 22 respondent expressed some concern about this aspects, mainly regarding collision with other traffic (need for separate lane, reliable sensors, reliable breaking system) and with travellers protection (lack of safety belts). However, performance on this indicator was rated in general as fairly good (3.5/5). On the opposite side, the level of privacy was not considered as of major importance (only 3.1 with no comments) and however as sufficient (3.1). Comfort and security got an average score as for importance (2.6 and 2.5) but a good performance (3.7). About the comfort, 7 comments were collected mainly about the driving style (that we know having been an issue during the showcase before it was solved with an intervention) and the narrow cockpit.
- Three more indicators were quantified or commented: the access ease for mobility impaired users got an 83% positive feedback; this rating is the same also within the small group of people that declared to be patients of the hospital (5 out of 133 respondents). Moreover a very high rate of travellers (29) criticized through the open question the slow speed of the cabs.
- Finally, the travellers expressed an average willingness to pay in a range of 1 to 2€ per journey.

As in the previous research (D5.2.1a) the possibility of having scores distinct by people profiles (gender, age, education, employment, income), was exploited in order to draw more detailed conclusions on user acceptance. For the sake of uniformity, and for making it possible to cross-compare the results between different sites, the following categories were considered:

- users with high school education (or higher),

- users with primary school education (primary school plus junior high school),
- people up to 30 years old,
- people over 30 years old.

Differently from the previously assessed sites, however, in this case only the distinction by age was possible, in fact the lower-education group would include only 8 respondents out of 133, not enough for significant conclusions.

The ratings for the two age categories are reported in the table below; differences compared to the global values are highlighted in yellow, lower differences in green. In general, no high difference was encountered; the highest differences were found in the weight given to the various aspects by the two age categories rather than in performances: Privacy scored an average 3.4 (1= max importance) for young travellers and a 2.8 for over 30; on the contrary, the under-30 were more concerned about safety (1.4 against 1.9 for over-30). Lower differences were recorded on the performance side: young people perceived the system as more useful (3.3/5 vs. 2.9/5), comfortable (3.9/5 vs. 3.5/5) and secure (3.8/5 vs. 3.5/5) than over-30.

Evaluation Category	Impact	Indicator	Importance			Ex-post performance rating		
			All	**Under 30**	*Over* **30**	**All**	*Under* **30**	*Over* **30**
Acceptance	User acceptance	Usefulness	3.0	2.9	3.0	3.1/5	3.3/5	2.9/5
		Ease of use	2.8	2.9	2.7	3.5/5	3.5/5	3.6/5
		Reliability	2.6	2.4	2.8	3.2/5	3.3/5	3.1/5
		User satisfaction for the on demand service	3.3	3.4	3.2	3.5/5	3.6/5	3.4/5
		Integration with other systems	3.2	3.3	3.1	3.1/5	3.0/5	3.1/5
	Willingness to pay	User willingness				1 to 2€	1 to 2€	1 to 2€
Quality of service	Comfort	Perceived comfort	2.6	2.7	2.6	3.7/5	3.9/5	3.5/5
	Privacy	Perceived level of privacy	3.1	3.4	2.8	3.1/5	3.1/5	3.0/5
	Perception of safety and security	Perception of safety	1.7	1.4	1.9	3.5/5	3.6/5	3.4/5
		Fear of attack	2.5	2.4	2.6	3.7/5	3.8/5	3.5/5
Social Impacts	Service accessibility	Access (times) for mobility impaired users				83%	81%	84%

Table 3 Average values for indicators dealt in the user acceptance survey of the Trondheim showcase distinct by two age categories.

= no rating available

= difference between Under30 vs. Over30 is >0.5

= difference between Under30 vs. Over30 is >0.2

5 Press coverage

As explained before, a press conference was organized on August 25th in order to advertise the showcase among the public. The Minister of Economy, as well as the local authorities and the CityMobil Project Coordinator participated in this conference, which was followed by a visit of the showcase. Both written and television journalists from national media assisted to the press conference. On August 25th, all the evening news shows in national TV presented the showcase and on August 26th, local and regional newspapers published information about the showcase.

6 Conclusions and recommendations

Several remarks can be done about this showcase, which can be considered for the success of future events of this kind.

In first place, the mobility application scenario deployed for the demonstration must be as close as a real application as possible. However, this depends strongly on the system's capabilities. Therefore, if the system's capabilities (vehicles, software or site) has not the performances or does not allow the demonstration of a real system, it is preferable to adapt the demonstration scenario to the actual demonstrator's capabilities, making clear for the public what would be like the real deployment scenario. This is also applicable to the demonstration site. It is preferable to execute the demonstration in a site where the real system would not be deployed if the conditions of doing it might hamper the impact of the showcase (the high level of cyclist traffic, the presence of delivery trucks and of a driving school in the case of Trondheim).

Secondly, as it was concluded in the Vantaa's showcase report (HOLGUIN ET AL., 2009), a close follow-up of the local partners' contributions is necessary, especially when the demonstration date is approaching, since decisions made locally can have a great impact on the event's success. Given the size of the demonstration, it is not possible to have a project member on site permanently, but the distant management during the preparation phase makes confusions and misunderstandings very much likely to happen. It is therefore advisable to create a demonstration follow-up matrix in order to avoid confusions between the local parties and the project. This will allow to keep track of any modification and to take corrective actions in face of any unexpected event.

Finally, the importance of a strong local consortium for the success of this kind of project and the need of a strong political support was demonstrated. Despite the long time that passed between the site selection confirmation (mid 2007) and the showcase execution (August 2009), the commitment to the showcase organization remained intact. Trondheim's local consortium was not only formed by local authorities (whose policies are subject to vary due to normal democratic processes), but by several different types of entities, guaranteeing continuity in the process. This was not the case in other cities that were ranked higher in the site selection process, but whose showcases were finally cancelled. The local political

calendar has to be taken into account since the showcase's organization is not supported by any formal agreement between the project and the City government, and any change in the local administration can lead to the cancellation of the demonstration.

7 References

1. GEA, DITS, Selected sites. CityMobil project deliverable 1.5.4. March 2007.
2. HOLGUIN, C. AND ALESSANDRINI, A., Vantaa showcase report, CityMobil project Deliverable 1.5.1.4. June 2009.
3. Van Dijke, J.P. (TNO). CityMobil project deliverable 1.5.2.5: Safety recommendations for the Trondheim showcase. August 2009.