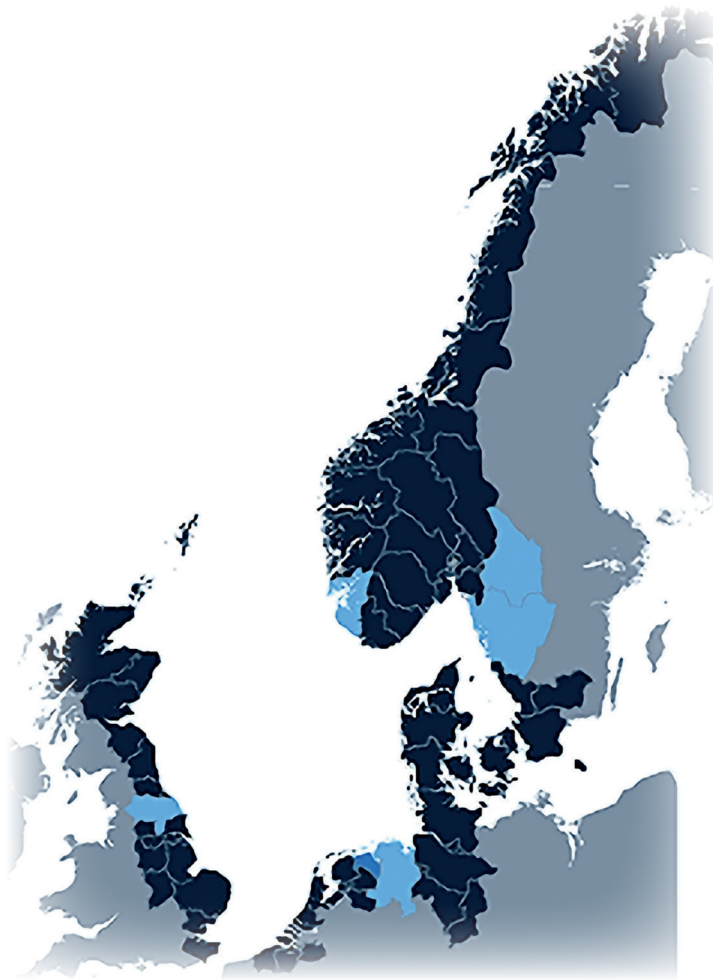


ITRACT – Best Practice Guide

User empowerment workshops for ICT applications



Work Package 5

Reference & Copyright

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Introduction

Accessibility and connectivity are essential for livability and economic growth throughout the world. Improving the accessibility of physical transport is important for achieving the social and economic inclusion of rural areas. In reality, rural areas lag behind with respect to physical accessibility and connectivity. The ambition of the ITRACT project (Improving Transport and Accessibility through new Communication Technologies) was to use ICT to create smart mobility services to improve accessibility and connectivity in rural areas.

The Digital Agenda for Europe is vital for realizing optimally accessible and connected rural regions in the North Sea Region. Moreover, collaboration between regions is essential to solve the problems of limited accessibility and connectivity in Europe. The transnational collaboration within the North Sea Region proved to be essential for realizing the mobility services within the ITRACT project, undertaken within the Interreg IVB North Sea Region Programme.

The ITRACT project started in 2012 and concluded in March 2015, developing more than 40 new ICT transport service concepts, in close interaction with users, transport organizations, transport authorities and local governments. These new smart mobility services were tested in fifteen pilots in five different rural regions in Norway, Sweden, Germany, England and the Netherlands. A novel ICT architecture was built to support the services. In a project extension awarded in 2013, new algorithms were developed to optimize the combined transportation of people and goods. These algorithms were also tested in pilots. To achieve the results, the project was divided into ten different work packages.

Work packages of the project

The ten different work packages were led by various project partners who collaborated in multidisciplinary and cross-border exchanges to create innovative and creative service concepts which were tested in diverse environments and regions.

General Project Activities

WP 1 Project management (Hanze University of Applied Sciences)

WP 2 Publicity and communication (University of Stavanger and Värmland County Administrative Board)

Service Development, Realization, Implementation and Testing

WP 3 Development of services and self-optimizing networks (Viktoria Swedish ICT)

WP 4 Information architecture and exchange mechanisms (Hanze University of Applied Sciences)

WP 5 Pilot testing on transport and accessibility (Jade University of Applied Sciences)

WP 7 Development and implementation of improved smart algorithms (Karlstad University)

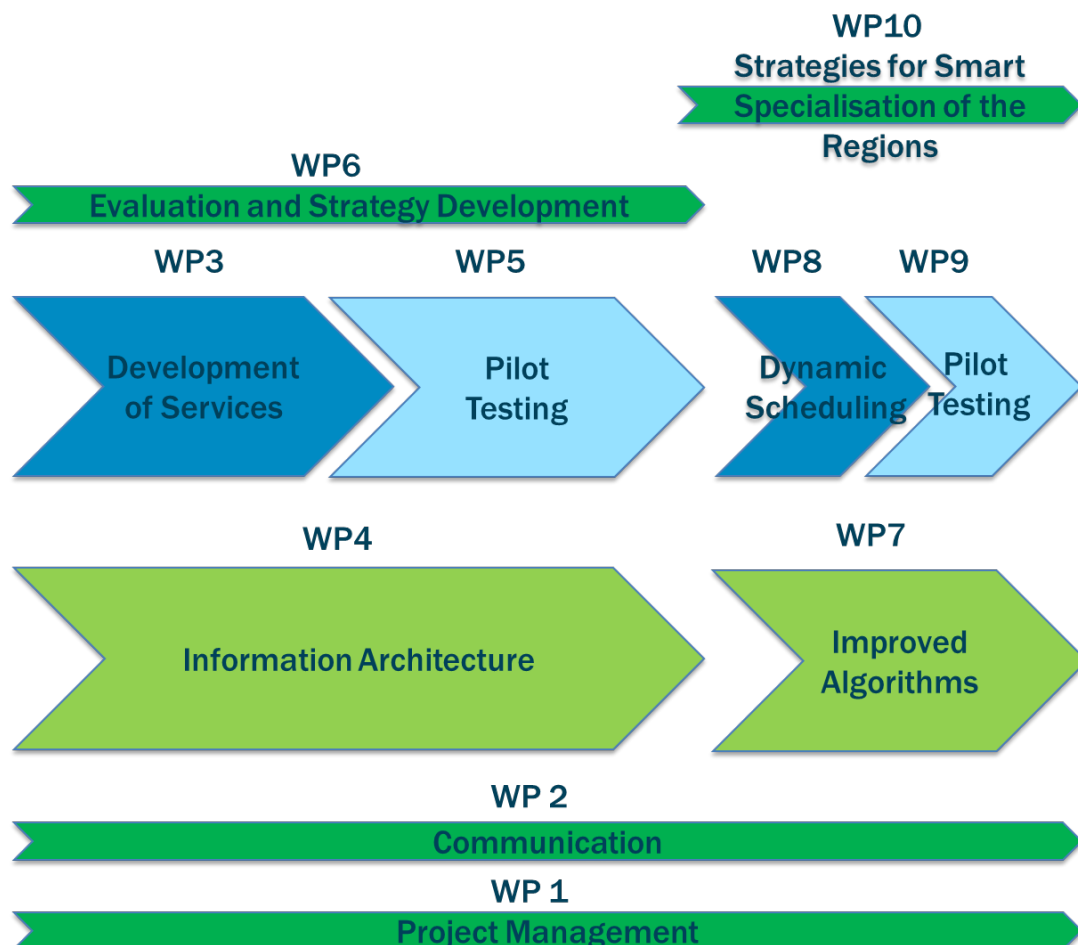
WP 8 Dynamic scheduling and incentivizing strategies for sustainable transport (University of Groningen)

WP 9 Pilot testing on transport and accessibility (Alliance Healthcare)

Policy Recommendations

WP 6 Evaluation and strategy development (University of Groningen)

WP 10 Strategies for smart specialization of the regions (Hanze University of Applied Sciences)



This Best Practice Guide

This Best Practice Guide (BPG), ‘**User empowerment workshops for ICT applications**’, is the result of WP 5. It intends to present findings, results and key issues based on the sharing of expert knowledge. The aim of this BPG is to contribute to knowledge sharing and learning in relation to the key issues surrounding user empowerment.

In Work Package 5, over 40 applications were developed. Additionally, 15 pilots were run in the regions participating in the ITRACT project. Descriptions of the applications can be found in the document ‘Applications and their piloting’.

The applications were developed on the basis of input received from the Service Innovation Workshops (Work Package 3). This input included the selection of target groups and determining functionality specific to the needs of those target groups. Despite the fact that these applications were tailor-made for select target groups, it was found that additional steps were needed to support the adoption of new applications and solutions by the intended users. User empowerment workshops were thus organized as part of Work Package 5 to create a better understanding of what is needed to turn target groups into enthusiastic users.

The report ‘Smart Map User Experience Survey’ about user experiences of managing trips using a cloud based real-time smart map developed within ITRACT project, can be found on the North Sea Region website.¹

Various transnational workshops on best practices for new services and technologies in transport and promoting accessibility were held with a diversity of stakeholders to strengthen a cross-sectoral cooperation. Regional and transnational workshops on the ‘Empowerment of the Users’ were organized to encourage residents of remote areas to make use of the newly developed applications.

One of the main aims of this Best Practice Guide is to encourage greater use of novel ICT applications in the North Sea Region as well as other regions. The success of innovation strategies in the North Sea Region depends on a balance between sustainability, user demand and market dynamics, to achieve greater inclusion, better public services and improved quality of life. To do this, local and regional authorities must be able to stimulate and train potential user groups, allowing them to use these applications for their own purposes.

The Best Practice Guide’s first objective is to provide local authorities and transport service providers, especially in remote areas, with more information about user empowerment workshops for ICT.

Its second objective is to increase the knowledge and capacities of local authorities and transport service providers with regard to the needs of specific groups using ICT applications, so they can adapt their services to these users and provide efficient, environmental and user-friendly transport concepts.

This Best Practice Guide contains select examples of ICT workshops from various countries across Europe to improve mobility and accessibility. We also present our basic recommendations.

¹ <http://www.northsearegion.eu/ivb/projects/details/&tid=132&back=yes>
V

The examples presented in this guide may be a valuable source of inspiration to:

- Transport service providers
- Enterprises and residents
- Local, regional and national transport authorities
- Local, regional, national and European policymakers, politicians and administrators
- Chambers of Commerce

The guide is divided into four chapters, listing the best practices to be employed in workshops that provide user empowerment through effective training in the use of newly developed ICT applications. It contains a brief description of relevant examples of best practices.

The following questions will be answered in this document:

- What are the aims of user empowerment workshops?
- How should they be organized?
- What are the lessons learned?

We also offer an overall answer to the question:

- Were the right services realized for the target group? In other words, did ICT help to improve the target group's experience of public transport as well as its accessibility?

Acknowledgements

The Best Practice Guide for User Empowerment Workshops is drawn from ITRACT (Improving Transport and Accessibility through new Communication Technologies), funded by the Interreg IVB North Sea Region Programme of the European Union.

Disclaimer

This publication, entitled 'Best Practice Guide to User Empowerment Workshops for ICT applications', was prepared by the ITRACT consortium of partners to provide information on how to organize effective user empowerment workshops on ICT applications with the aim of improving mobility and accessibility through new communication technologies in remote areas in Europe.

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1 Usability and User-Friendliness of ICT Applications in Public Transport

1.1 Background

As mentioned above, the overarching aim of the ITRACT project is to develop strategies for further implementation of transport modes supported by innovative technologies.

Using public transport often requires changing between different lines or modes of transportation on time. This is even more crucial when a trip includes transfers from long to short-distance transport networks and vice versa.

The use of ICT applications by people planning trips or already on the move offers them the opportunity to access information at the time and place and the situation in which it is needed (the concept of InfoConnectivity).²

Providing the right information on facilities and services that people require throughout their journey should improve their travel experience and ease the change between public transport lines and modes. Such information may be provided, for example, by mobile phone applications or mobile phones cameras that read information provided by QR (Quick Response) codes.

Improving the connectivity and accessibility of public transport through user-friendly ICT applications, will improve the use of public transport in general. It is expected to increase the numbers of local people choosing public transport and the numbers of tourists revisiting remote areas. This will lead to a drop in emissions generated by cars in private use.



*Figure 1:
Workshop Wilhelmshafen*

² IC-IC Enhancing interconnectivity of short and long-distance transport networks through passenger-focused interlinked information-connectivity was developed under the European Community's Seventh Framework Programme, theme [TPT.2010-4. TPT.2010-5. TPT].

1.2 ICT Application and Usability

Innovative tools for efficient, user and environmentally friendly transport networks across the North Sea Region have been developed and tested throughout the ITRACT project.

ITRACT partners are convinced that ICT applications providing information about public transport should ease the access to information and improve the quality of travel. That is why it is important that the ICT applications provided are well adapted to the activities and needs of the users. Only with user-friendly ICT tools is it possible to encourage the residents of scarcely populated areas to make use of the new services. In other words, user-friendliness means easy to use, which in turn means usability.

At the beginning of the ITRACT project, before we began developing new ICT applications, service innovation workshops were held to determine target groups and 'user profiles', such as 'kids and teenagers', 'adults' and 'sunset generation' (see BPG WP 3: 'Transnational business models for ICT-based transport services'). Different stakeholders, such as bus companies and passenger organizations, were involved in the development of new ideas about useful ICT applications. Some of the ideas discussed were further developed and tested in other workshops during the project.

It is important for users to be involved in the development of new ICT applications. If users are involved at an early stage, it is easier to guide ICT tool development towards a solution that suits users' needs and skill levels. A user-friendly ICT application should be designed in a way that allows its efficient use by all groups of users. 'Usability' is an important indicator of the suitability of a user interface. The user-friendliness of ICT applications should thus be tested in usability tests.

Therefore, before organizing user empowerment workshops, it is important to conduct a usability test and make sure the ICT applications are user-friendly, because user-friendliness is the basic condition of user empowerment.



*Figure 2:
Workshop Wilhelmshafen*

1.3 Usability Testing Methods

Definitions of ‘usability’ can be found in many sources (e.g. ISO 9241 and economics dictionaries) and it has been defined by various computer scientists, such as Ben Shneiderman’s eight golden rules³ or Jacob Nielsen’s ten heuristics.⁴

The ITRACT project partner Jade University of Applied Sciences has extracted criteria of usability based on the sources mentioned above. They were used as parameters of quality, recommended in the development of ICT applications in the ITRACT project.

Based on the usability criteria, a guideline⁵ for the realization of user-friendly ICT applications was developed by the ITRACT project partner Jade University of Applied Sciences in Wilhelmshaven. The centrepiece of the guideline is a checklist which allows developers to test the user-friendliness of their application. The guideline also gives instructions on which testing procedures can be used, all of which are described in the guideline.

At Jade University of Applied Sciences we identified testing methods which would enable partners to prove the usability of ICT applications. The methods differed in terms of the technical effort, knowledge and experience required. Methods that do not require any tools, such as working with target groups, card sorting, use cases, focus groups or cognitive walkthroughs, can be done by developers and business experts. Methods such as usability tests, A/B tests, multivariate tests and surveys can be done by developers and business experts, but they will require the support of usability experts. Eye-tracking should be done by usability experts, with the support of the developers and business experts. The guideline gives information on the different usability test methods and helps to select a suitable testing procedure.

Some of the usability testing methods mentioned above were used in the ITRACT project to develop user-friendly ICT applications. The Norwegian partners for example, conducted a survey to gain knowledge about the use and the potential influence of ICT applications on passenger bus services and other collective transport means in the Stavanger region in Norway. The survey was based on a questionnaire distributed through the internet and was analysed by using the statistics software package SPSS.

Eye-tracking was also used to test the ability of ICT applications in the ITRACT project. Developers were asked to send their applications to Jade University of Applied Sciences for this test.

³Shneiderman, Ben: ‘The Eight Golden Rules of Interface Design’. At: University of Maryland. Status as of 11 Dec. 2014. <http://www.cs.umd.edu/~ben/goldenrules.html>.

⁴ Nielsen, Jakob (1994). Usability Engineering. San Diego: Academic Press. pp. 115–148. ISBN 0-12-518406-9.

⁵ See Appendix

2 Organization and Preparation of User Empowerment Workshops

In the ITRACT project, partners were trained and informed about how to organize user empowerment workshops in a special ‘train-the-trainer’ workshop prepared by Jade University of Applied Sciences. It was possible to choose between two possible dates to participate in these workshops. The following procedure proved to be the most efficient.

The first step is to identify different key target groups of participants for the ITRACT User Empowerment Workshop. For example:

- Pupils and students: digital natives, very familiar with new technology and mobile devices
- Commuters: not necessarily digital natives but new technology is often necessary for their job, they are generally familiar with mobile devices and can be informed by videos or texts about new applications
- Elderly people: often not familiar with new technology and mobile devices, high inhibition threshold, tremendously high potential. Focus on elderly people.

Most of the ITRACT partners focused on elderly people. To find people from the defined target groups to participate in user empowerment workshops, the ITRACT partners focused on specific organizations, places and officials:

- Organizations/associations such as cultural societies
- Sports clubs, pensioners’ clubs
- Groups of retirees from local bus services
- Officials within local government dealing with retiree concerns

People were also approached personally or via posters and advertisements in local newspapers.

Before the ITRACT User Empowerment Workshops started, rooms, technical equipment, hand outs and other facilities were prepared. It is important to define and implement standard setups prior to a workshop. The preparation of email or app-store accounts, for example, may also be necessary. Creating an easily understandable video also helped to decrease the inhibition threshold of the participants and lowered fears of too much complexity.

A very important point was the preparation of a comfortable and pleasant ambience to increase communication and improve the learning process during the ITRACT User Empowerment Workshops. It also helped to reduce the inhibitions of the participants. Drinks and cakes were always very helpful in creating a pleasant atmosphere.

The ITRACT User Empowerment Workshops mostly started with an introduction to the project and the reasons why the hosts were involved in the project. Basic information about the benefits of using new technology and mobile devices was provided and examples of useful applications, such as email, weather forecasts and navigation tools, were introduced. Explaining the function of smart phones, tablets and the benefit of the newly developed ICT applications was the next step, before participants started to work with the technical equipment provided. Assistance was always needed and a ratio of 1 to 2 between assistants and participants was very useful. After working with the technical equipment, the participants were given time to offer feedback to the hosts and to ask further questions.

A guide to using smart phones, iPads, etc. was often handed out to participants so they could follow up on what they had learned at home. The guide also listed the most popular journey-planning websites and instructions which made it easier to use such applications.

The greatest challenge of the ITRACT User Empowerment Workshops was the participants limited knowledge about smart phones, tablets, app stores and the internet.



Figure 3: Train the Trainer Workshop

3 Selected User Empowerment Workshops

3.1 ITRACT User Empowerment Workshop in the Yorkshire Dales

3.1.1 Geographical Area

The Yorkshire Dales is an upland area of the Pennines in northern England. The area is roughly in the centre of Great Britain. It includes Yorkshire Dales National Park and Nidderdale Area of outstanding natural beauty, with contiguous areas.

3.1.2 Subject

Rural areas in northern England are undergoing a significant population decline compared to growth in the south. This will cause a change in demand for public transport structures and facilities. For example, broadband coverage is not yet available, but is an important factor in reducing the social and economic exclusion of remote areas.

The User Empowerment Workshop was held to introduce the new journey planner, ShareRoute, which was developed in the Yorkshire Dales as part of the ITRACT project.

3.1.3 Objectives

The ICT application ShareRoute was developed to raise the level of e-services in the public transport system and to enhance the accessibility of facilities and the mobility of the population in the Yorkshire Dales.

The User Empowerment Workshop aimed to introduce the participants to these newly developed ICT applications and teach them how to use these applications in daily life. Furthermore, it was an opportunity to find out whether the newly developed ICT application was suitably adapted to the handling and needs of the users.

3.1.4 Overview

ShareRoute is a new journey planner for the Yorkshire Dales, which includes information on local community transport and taxi services, along with bus and train timetables. At the time of writing, it is still under development and will be completed by the end of 2014.

Online journey planners are designed to help find the best method of getting from one location to another. This could be a simple search, such as finding a bus to local shops, or it could be a more complicated journey, such as a scenic tour of the Yorkshire Dales.

ShareRoute is able to combine different means of transportation to provide users with the quickest and most accurate route. Using ShareRoute makes comparing various bus and train timetables redundant. It combines connections between different services, it is easy to use and can produce a route plan within seconds. ShareRoute allows users to specify the time and date on which they wish to set off.

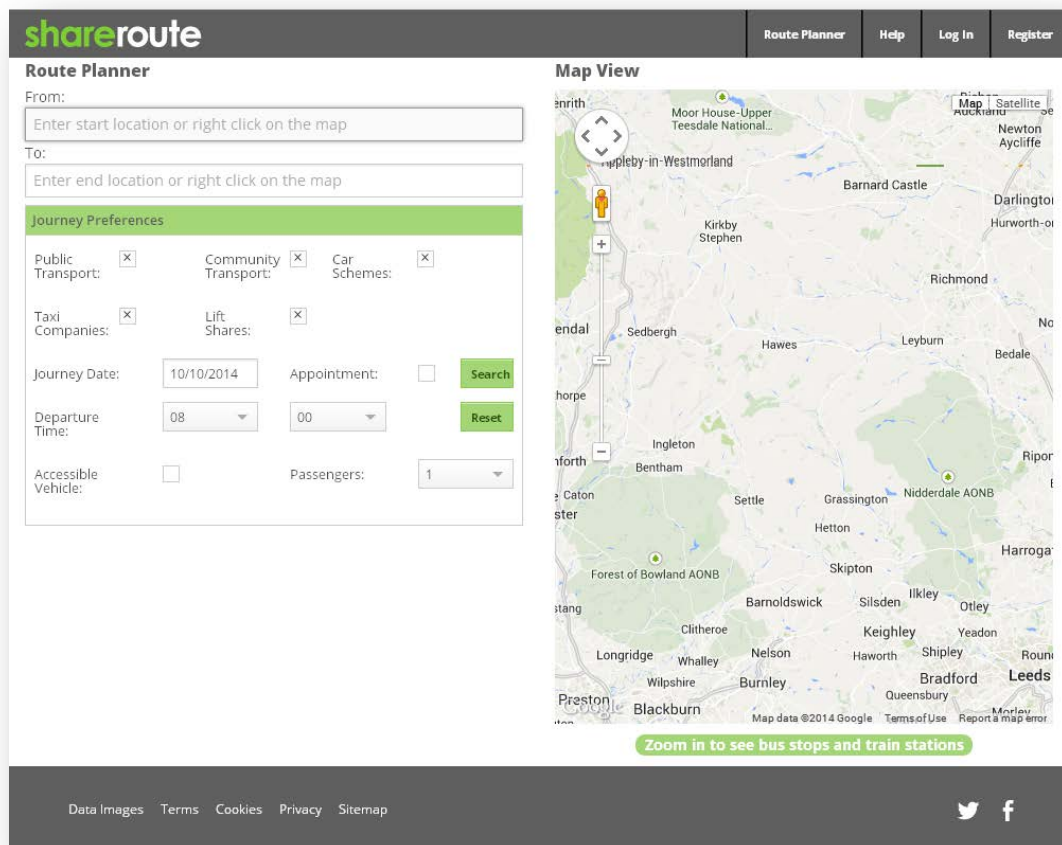


Figure 4: ShareRoute User Interface

3.1.5 Methods

The Yorkshire Dales ITRACT User Empowerment Workshop was held in October 2014 at Hudson House, Reeth, as a basic computer training session looking specifically at journey planners and introducing ShareRoute, which was developed in the Yorkshire Dales as part of the ITRACT project. An advertisement was placed in the October issue of the *Reeth Gazette* to encourage people to participate in the event. Posters were placed on the Hudson House notice board, and at the Reeth Community Centre, the library and the tourist information centre. The event was hosted by Quick Start IT and West Yorkshire Combined Authority.

A variety of laptop and tablet devices were provided for the event. The ITRACT User Empowerment Workshop was held in the computer room in Hudson House, which had four Windows 7 desktop computers that participants could also use. As a drop-in session, the event was tailored to the needs of each person who attended. The participants were shown the pilot version of our new ICT application

ShareRoute and, after testing, had time to give feedback to the hosts and to ask further questions.

A basic guide to using journey planners and ticket booking websites was prepared and handed out to people who attended the event, so that participants could follow up on what they had learned at home. The guide included the most important information about popular journey-planning websites to make them easier to use.

3.1.6 Time and place

The Yorkshire Dales ITRACT User Empowerment Workshop was held on Wednesday, 15 October 2014 at Hudson House, Reeth.

3.1.7 Evaluation

While the main aim of the ITRACT User Empowerment Workshop was to show people how to use online journey planners and ticket booking systems, it became apparent that this was not what the participants who came along were mainly interested in. The people who attended the User Empowerment Workshop either did not use computers at all or only occasionally used the public computer in the library. Thus, their computer skills level was low or non-existent. Most were therefore interested in the absolute basics of using a computer and/or the internet. Nevertheless, most were interested in taking their learning further in other computer courses taking place locally. After the event, participants interested in learning about basic computer skills were referred to a voluntary organization in Richmond which runs occasional computer courses.

3.1.8 Lessons learned

The participants wanted to know what kind of device they should buy so they could go online, and they showed most interest in tablets such as the iPad, rather than desktop or laptops, which they felt were too hard to handle.

In addition, most of the participants did not actually use public transport at all, and therefore they were not interested in journey planners. In fact, they felt that public transportation was not really an option for most journeys into remote parts of the Yorkshire Dales. In fact, they were concerned that the situation might only deteriorate due to increasing cuts in local government budgets.

Were the right services realized for the target group? Did ICT help to improve the target group's experience of public transport as well as its accessibility?

The way people were selected for the User Empowerment Workshop was too general and those who would benefit most from the developed services did not participate sufficiently. The selection of participants should be more focused on those who meet the user profile for which the services were developed.

3.1.9 Contact information

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3.2 ITRACT User Empowerment Workshop at Jade University

3.2.1 Geographical Area

The Ems-Jade region is located in Lower Saxony in northwestern Germany. It borders directly on the Netherlands in the west and this peripheral location at the extreme northwest of Germany goes hand in hand with rural settlement structures.

3.2.2 Subject

The Ems-Jade Region faces a future with an aging and diminishing population. The demographic change will have an impact on all areas of society and will also cause a change in demand for regional infrastructure and facilities.

The ITRACT User Empowerment Workshop was held to introduce the new ICT applications Online Route Network (Bus lines J3.1, J3.2) and a GTFS to PDF converter (for J18 timetables) to citizens. The ICT applications were developed at Jade University as part of the ITRACT project.

The applications were developed with the cooperation of VEJ, which is the umbrella organization for all local bus companies. To test the application in urban regions, the Stadtwerke Wilhelmshaven provided their schedules and participated in testing, while cooperation with Edzard Reisen was established for remote rural regions. The two bus companies each provided a bus to test the real-time trackers. The VEJ also asked all of the local bus companies for permission to use their schedule data in GTFS format. This data is provided by Connect, which hosts all schedules for Lower Saxony, to any interested party.

3.2.3 Objectives

Elderly people were the main target group for public transport in the region of Wilhelmshaven/Friesland/Ostfriesland. The main aim of the ITRACT User Empowerment Workshop was to introduce participants to the newly developed ICT applications and teach them how to use and pass on the newly learned knowledge to family members and friends. The event aimed to contribute to the mobility of elderly people in the Ems-Jade region.

3.2.4 Overview

The ITRACT User Empowerment Workshop introduced the new ICT applications Online Route Network (Bus lines J3.1, J3.2) and a GTFS to PDF converter (for J18 timetables) to interested citizens.

Online Route Network – representation of bus lines

In this ICT application, all buses within a certain region are integrated into a digital map (Open Street Map: OSM). With this application the user can easily find buses and departure times for his/her current position. It can be used on any smart phone. The independence of the platform is based on the use of HTML5/CSS. The ICT application works with data derived from Microbus planning software, with which bus schedules are generated in Germany. These data are converted to the GTFS format.

GTFS to PDF converter

The basic idea of this ICT application is a converter, which uses the centrally hosted GTFS data to generate a printable schedule in PDF format for a given bus stop. Because the PDF is generated on the fly, it is always up to date. It also eliminates the tedious process of uploading all timetables for all bus stops to a web server to make them available to the public after a schedule change. Target groups for this ICT application are the public bus companies who can use the generated timetables for their bus stops as well as the customers who want a printed version of the schedule at the bus stop.

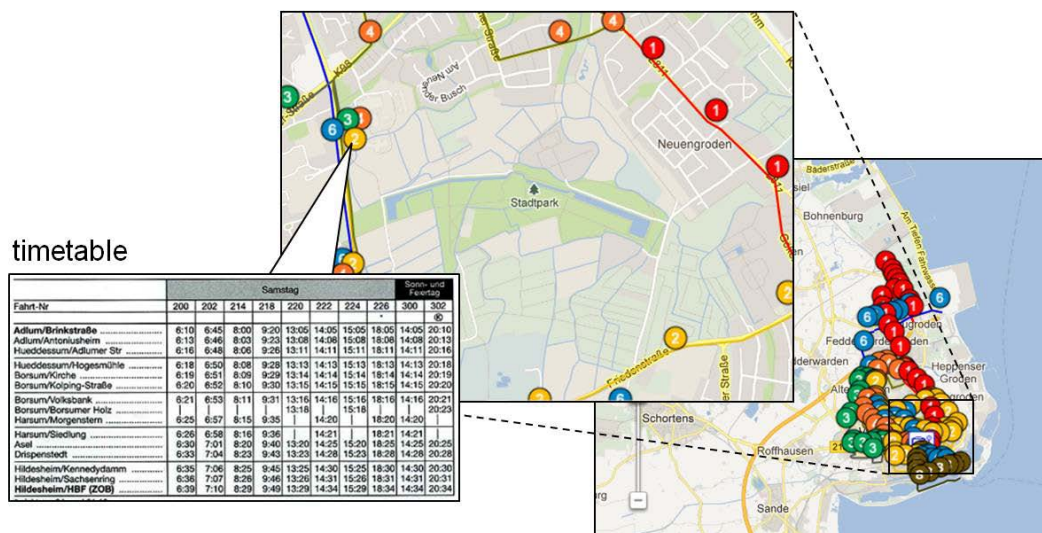


Figure 5:
Applications Jade University
of Applied Sciences

These ICT applications can be used by anyone planning to use public transport services to get from A to B. The applications are easy to handle, so that anyone who has a smart phone or any other mobile device (i.e. tablet) can use them, special skills are not required. The applications can be used by travellers who rarely use public transport and also by commuters who use the bus regularly to get to work or for leisure activities. Because of the use of the GTFS format, the application can be easily adapted to other regions. To facilitate this further, all language-specific text is presented in an easily editable file.

3.2.5 Methods

Senior citizens were encouraged to participate via different channels, such as various senior sports clubs, a press release and by approaching them personally. A group of nine senior citizens, including the senior citizens representative of the city of Wilhelmshaven, attended the ITRACT User Empowerment Workshop.

Firstly, a short introductory film was presented to the participants. It demonstrated the advantages of using ICT applications and was meant to help reduce the inhibitions of the participants.

The ICT applications were explained and then tested by the participants with the assistance and support of the hosts. During a subsequent group discussion, the participants were asked about their experiences with the ICT applications and about their ideas and needs for the future.

A guide to using smart phones, iPads, etc. was prepared and handed out to participants so they could follow up on what they had learned at home. The guide also listed the most popular journey-planning websites and provided information to make it easier to use such applications.

3.2.6 Time and Location

The ITRACT User Empowerment Workshop was held on 14 March 2014 at Jade University of Applied Sciences Wilhelmshaven.

3.2.7 Evaluation

The advantages of this application is that it merges three applications into one with a high range of functions. In the near future, another ICT application from Jade University of Applied Sciences that creates real-time data on the position of the buses (using GPS trackers) will also be integrated into this combined application. Using this final combined application, the user of public transport will receive valid real-time departure and arrival schedules for the relevant buses. The use of the GTFS format and the separate language files make it very easy to adapt this application to other regions.

Organizations such as public transport companies can simplify the process that their customers use to find valid and up-to-date timetable information from any desired bus line. Many people might not travel with public transportation because they may not be able to read bus stop timetables, with their many exceptions shown only in tiny footnotes. They may also be unable to read the usually small

print on the schedules. This problem is addressed by the provision of a ‘departure monitor’, which only shows the next bus departure and its final destination. The transport companies expect to attract more customers with this application.

3.2.8 Lessons learned

A network-connected device is mandatory for the user. A browser can access all functions of the application, so no further software downloads are necessary. Basic skills in using a browser on a mobile device are required. The ITRACT User Empowerment Workshop showed that these skills are not always present, especially for our main target group of senior citizens. However, the event proved that these skills can be acquired within a relatively short time.

Were the right services realized for the target group? Did ICT help to improve the target group’s experience of public transport as well as its accessibility?

Although there were some minor difficulties with the technical execution of the services, the services developed did prove to be helpful in improving transport and its accessibility.

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3.3 ITRACT User Empowerment Workshop at Groningen

3.3.1 Geographical Area

The Province of Groningen is located in the northeast of the Netherlands and borders directly on Germany in the east. In this area, the ITRACT project partner, Hanze University of Applied Sciences, is focused on the population of east Groningen, more specifically, the municipality of Oldambt.

3.3.2 Subject

It is expected that in the future a larger group of older citizens in eastern Groningen will be dependent on public transportation, not only because of an increasing number of senior citizens, but also because of the concentration of facilities in central villages. A large proportion of the population will have to cover larger distances to reach facilities such as hospitals and supermarkets. It will be a challenge to maintain the highest possible levels of accessibility to facilities and mobility in east Groningen, which has one of the fastest shrinking populations in the Province of Groningen.

Three prototypes of ICT applications were developed during the ITRACT project: Step by Step, Scan & Go and OV Lift. The ITRACT User Empowerment Workshop was organized to introduce the new ICT applications to citizens.

3.3.3 Objectives

The workshop aimed to contribute to the mobility of elderly citizens and also to the development of user-friendly technologies. To offer the elderly support in the use of public transport, ITRACT developed user-friendly ICT solutions in the form of three different ICT applications. These newly developed applications can assist older people before they use public transport (e.g. when planning a journey, looking up departure times, etc.) and when using public transport (e.g. to work out where to get off the bus, to find the bus stop for the return journey, etc.). One aim of the workshop was to introduce the participants (senior citizens) to the newly developed ICT applications and teach them how to use these applications.

The participants expected to be given a good explanation of how public transport works. A number of participants also wanted to gain more confidence in travelling by bus. Furthermore, they expected that it would be easier to reach certain facilities because they would be able to check exactly how to get there by public transport.

3.3.4 Overview

The User Empowerment Workshop introduced the newly developed ICT applications Step by Step, Scan & Go and OV Lift.

3.3.5 Step by Step

The first application provided a step-by-step explanation of how public transport works. The application only contains information on travelling by bus or train. For example, information on how to plan a journey, on the public transport chip card and on the map with the locations of neighbouring bus stops. The application could be viewed during or before a journey.

3.3.6 Scan & Go

This ICT application provided information on tourist destinations in east Groningen and how they could be reached by bus. A destination can be selected by scanning a QR code or by choosing a location. The QR codes and the details on the destinations are listed in a booklet.

The application provides information on destinations, a bus travel planner and a map showing how to get from a bus stop to a destination. The application can also be used to plan a return journey.

3.3.7 OV Lift

The OV Lift application assists travellers to find a public transportation hub. Users can also request a lift to that hub or offer one themselves. This application will be more effective the greater the number of people using it.

3.3.8 Methods

During the pilot project in east Groningen, a group of senior citizens tested prototypes of the apps in a living lab. The Sociaal Planbureau Groningen was asked to organize the ITRACT User Empowerment Workshop and to chart the results.

A total of five people aged between 65 and 80 attended the event. Three participants occasionally travelled by bus, two of them at least once a week and one of them less than once a month. One person never used public transport. All of them, as individuals or as members of a household, had a car at their disposal. Three had a driving licence. Three of the participants used the internet and all had a mobile phone. Two of these participants used a mobile phone with access to the internet and they occasionally downloaded apps by themselves.

The potential participants were approached through various channels. A first group was contacted through the Grijze Muizen, a group of senior citizens from Winschoten and the surrounding area who, together with the Stichting Welzijn Oldambt (Oldambt foundation for welfare services), organize meetings to increase their computer skills. Approximately 30 people were contacted through the Grijze Muizen. A second group was approached through the Steunstees (support centres) at Finsterwolde, Bellingwolde and Bad Nieuweschans. This group consisted of 20 elderly persons. A third group asked to participate consisted of a number of people from the CMO network.

Of the five people who were willing to participate, three were members of the Grijze Muizen and two were from the CMO network.

The OV-bureau provided Dal-Dagkaarten (off-peak day travel passes) free of charge to participants in the pilot project. Also, a number of smart phones and tablets were made available for use by the participants.

The participants were first asked to fill in a short questionnaire about their mobility and internet use. The aim was to gain insight into their use of public transport and their knowledge of the internet and smart phones. The three ICT applications were then explained and tested by the participants with the assistance and support of the hosts. The participants were then asked to assess the applications by filling in another questionnaire, which had been developed within the ITRACT project.

In a subsequent group discussion, the participants were asked about their experiences with the ICT applications and about their ideas and needs for the future.

3.3.9 Time and Place

The ITRACT User Empowerment Workshop was held in summer 2014 in the Sociaal Planbureau Groningen.

3.3.10 Evaluation

During the test period, it became apparent that not all of the applications were properly set up. While the Scan & Go application could be accessed, after a while, various test subjects noticed that the application showed an error message when they were searching for a destination. Not surprisingly, the participants were mostly dissatisfied with the application's user-friendliness. The OV Lift application could not be accessed at all during the test period, so it was not used and could not be included in the test results.

Nevertheless, the discussion partners said that they would be willing to use the applications in the future if the technological problems were resolved and the Scan & Go application was made more user-friendly.

The design of the ICT applications was considered clear and as potentially serving the intended purpose. In general, the participants indicated that the applications provided a rather good explanation of public transportation. However, this did not mean that they would take the train or bus more often. Most of the participants were non-committal about whether the ICT applications actually helped make facilities more accessible simply by informing them about public transport. There were two main reasons. Some participants indicated that they would continue using their cars, as the time they needed to get somewhere by car was far less than the time needed by public transport. Other participants already knew how public transport worked and were already using it.

3.3.11 Lessons learned

Participants who were slightly older (75+) than the others had little or no experience with the internet and mobile phones. In addition, they made little or no use of public transport. Instead, they tended to use a RegiotaxiPluskaart (a travel card for a shared taxi) if they did not have access to a car (or no longer owned a car).

The participants suggested using larger fonts or ensuring that they could be enlarged by the user, as the font size was fixed and the text was illegible for many of the participants.

Were the right services realized for the target group? Did ICT help to improve the target group's experience of transport as well as its accessibility?

One lesson learned is that the people present do not always match the user profiles defined in the service workshops. Therefore, it is inconclusive whether the right services were developed.

Some technical issues prevented the real use of the applications and therefore the empowerment of the users did not occur. Clearly, the ICT application must work properly before empowerment can take place.

3.3.12 Contact information

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4 Summary

The goal of the user empowerment workshops was to gain a better understanding of whether and, if so, how the newly developed applications and services would provide the appropriate support to users in their daily lives and lead to more accessible transport. The services were developed using Service Innovation Workshops, with specific target groups who would use these services in mind.

User empowerment workshops should involve people who more or less mirror the user profiles for which the services were developed in the first place. The regional workshop organizers often had trouble finding people who fit these profiles, illustrating both the difficulty of reaching specific members of more general target group, such as the 'elderly' or 'tourists', and the general inclination of authorities to think in terms of 'one-size-fits-all' solutions. Therefore, the most important lesson learned about setting up User Empowerment Workshops is obvious: find people who fit the archetype defined in the Service Innovation Workshops.

Another lesson learned is that the ICT must work before empowerment can take place. We found that generally people will judge the service on its functional rather than its technical aspects. In contrast, technical experts are quite willing and capable of judging a technical innovation on its potential rather than on its actual performance. The common user will judge a service based on whether it is fully operational; if not, it is likely to be considered rather worthless.

The ITRACT project clearly demonstrated that organizations such as public transport companies can use ICT applications to offer more and better information and services. The participating transport companies expect to attract more customers with user-friendly ICT applications. Whether senior citizens (or others) will use the tested ICT applications in the future or not, will depend on the ICT skills of the individuals. The ability and willingness of senior citizens to use ICT-based applications varies widely. The uptake of usage by target groups can therefore never be taken for granted and interventions should be designed to empower and motivate intended users. The User Empowerment Workshops were designed to do just that.

The ITRACT User Empowerment Workshops also demonstrated that newly developed ICT applications are not automatically user-friendly products. Thus, users should also be involved in their development as early as possible. Only ICT applications that are well adapted to the needs of the user will be used by many people and consequently lead to their empowerment. Elderly people often have problems travelling by public transportation, for example because they may not be able to read timetables printed in small font sizes, or may have problems understanding announcements at railway stations. ICT applications used on smart phones, iPads or computers should offer solutions to such problems (and especially not replicate them).

The ITRACT User Empowerment Workshops showed that there is also a need and demand for training in computer skills and mobile devices such as smart phones or iPads, specifically for the elderly. The acquisition of such skills is a prerequisite to being able to use ICT applications and, consequently, to user empowerment.

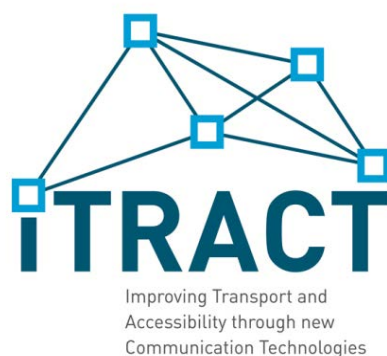
A worthwhile task and future challenge for local and regional agencies in the North Sea Region would be to offer training, not only in computer skills but also in public transport ICT applications, thereby encouraging the growing target group of elderly people to make use of new services. These newly acquired skills may also help them to navigate their way through other aspects of the increasingly digitalized world.

5 Appendix

5.1 Organization Model for usability-testing in ITRACT

Organization model for pilot development in ITRACT:definition, implementation, testing and evaluation

To be filled out for every pilot within ITRACT project!



Name of pilot leader: Click here for typing!

1. Pilot definition

Title of Pilot: Click here for typing!

(Mobile) applications the pilot consists of:

name of (mobile) application	abbreviation of (mobile) application, e.g. R2, J5*
Click here for typing!	Click here for typing!
Click here for typing!	Click here for typing!
Click here for typing!	Click here for typing!
Click here for typing!	Click here for typing!
Click here for typing!	Click here for typing!
Click here for typing!	Click here for typing!

*) nomenclature see spreadsheet in ProjectPlace: /Working Folders per WP/.../WP500_Overview_mobile_applications_and_pilots_ITRACT

Description of Pilot → goal, features, target group (abstract):

Click here for typing!

Tasks and queries for this project step (checklist):

(Please make use of this checklist to ensure a proper project course!)

**completion
date**

Nomination of a pilot leader.

date

Outcome: [Click here for typing!](#)

Generation of timeline for pilot definition, implementation, testing and evaluation according to ITRACT-project plan).

Outcome:

start date pilot definition: date

completion date pilot definition: date

start date pilot implementation: date

date

completion date pilot implementation: date

start date pilot testing: date

completion date pilot testing: date

start date pilot evaluation: date

completion date pilot evaluation: date

Planning and arranging necessary human, monetary and physical resources.

date

Outcome: [Click here for typing!](#)

Definition of scenarios that should be 'run' with real users within pilot testing phase.

Outcome:

Scenario 1: [Click here for typing!](#)

date

Scenario 2: [Click here for typing!](#)

Scenario 3: [Click here for typing!](#)

Checking with WP 4 if realization of pilot and scenarios is technically possible.

date

Outcome: [Click here for typing!](#)

Defining which (local) transport company will execute the pilot testing phase and offer the new service (think of transnational collaboration!).

date

Outcome: [Click here for typing!](#)

Searching for, inviting and preparing possible user groups for pilot testing phase. Make sure that necessary hard-, software and licenses are available for testing phase.

date



Outcome: [Click here for typing!](#)

Comments:

[Click here for typing!](#)

2. Pilot implementation

Tasks and queries for this project step (checklist):

(Please make use of this checklist to ensure a proper project course!)

**completion
date**

Creating building environment (programming environment, server, licenses) in close cooperation with WP 4.

date

Outcome: [Click here for typing!](#)

Using WP 4's architecture and building blocks.

date

Outcome: [Click here for typing!](#)

Considering the Organization Model for usability-testing (see → ProjectPlace → Deliverables per WP → WP5 → Organizational Model for usability-testing -> Usability_Guideline_Checklist.pdf)

date

Outcome: [Click here for typing!](#)

Pre-Testing of pilot by using it yourself and by other team members in consideration of scenarios specified during pilot definition.

date

Outcome: [Click here for typing!](#)

Using results of pre-tests for optimization of pilot's programming architecture.

date

Outcome: [Click here for typing!](#)

Comments:

[Click here for typing!](#)

3. Pilot testing

Tasks and queries for this project step (checklist):

(Please make use of this checklist to ensure a proper project course!)

**completion
date**

Mobilizing test users, equipping them with necessary hard- and software (licenses), instructing them for pilot testing and running pilot exemplary for demonstration reasons.

date

Outcome: [Click here for typing!](#)

Offering helpdesk for pilot user (1. leader of pilot, 2. member of pilot development group, 3. WP4 helpdesk) and equipping user with necessary contact details.

date

Outcome: [Click here for typing!](#)

Asking pilot user from time to time for intermediate review reports (verbally or in written form).

date

Outcome: [Click here for typing!](#)

Using intermediate reports from users for modification and improvement of pilot. Performing changes simultaneously. Testing changes. Implementing the results in the running pilot.

date

Outcome: [Click here for typing!](#)

During pilot testing: informing stakeholders (e.g. ITRACT community) about intermediate results and how the pilot is doing. Making use of twitter, newsletter, emails, ProjectPlace etc..

date

Outcome: [Click here for typing!](#)

Stopping the pilot testing phase. Sharing, retrieving and analyzing questionnaire (see 4. Pilot evaluation).

date

Outcome: [Click here for typing!](#)

Completing this document for documentation reasons.

storage name: Add abbreviations of mobile applications the pilot consists of to document name (e.g.: Organizational model for pilot development R2 V4.doc)

date

storage location: → ProjectPlace → Deliverables per WP → WP5 → Organizational Model for pilot development --> Pilots

Outcome: [Click here for typing!](#)

Presenting results to

- ITRACT community
- other stakeholders (user group, local government, local transport companies etc.) using ProjectPlace, newsletter, press etc..

date

Outcome: [Click here for typing!](#)

Comments:

[Click here for typing!](#)

4. Pilot evaluation

Questionnaire^{*)} relating to use, usability and costs of pilot:

Questions → to be answered by pilot users	answers 1: excellent 2: good 3: satisfactory 4: adequate 5: poor 6: unsatisfactory
1. How convincing does the pilot meet your expectations in general?	<input type="text"/> 1 <input type="text"/> 2 <input type="text"/> 3 <input type="text"/> 4 <input type="text"/> 5 <input type="text"/> 6
2. How convincing does the pilot meet your demands concerning the features you need?	<input type="text"/> 1 <input type="text"/> 2 <input type="text"/> 3 <input type="text"/> 4 <input type="text"/> 5 <input type="text"/> 6
3. How do you evaluate the performance and the speed of operation of the pilot!	<input type="text"/> 1 <input type="text"/> 2 <input type="text"/> 3 <input type="text"/> 4 <input type="text"/> 5 <input type="text"/> 6
4. How are the pilot's features realized in terms of usability - is it user friendly?	<input type="text"/> 1 <input type="text"/> 2 <input type="text"/> 3 <input type="text"/> 4 <input type="text"/> 5 <input type="text"/> 6
5. Is the pilot's graphical user interface reduced to the essentials and aesthetic in design?	<input type="text"/> 1 <input type="text"/> 2 <input type="text"/> 3 <input type="text"/> 4 <input type="text"/> 5 <input type="text"/> 6
6. Is the pilot suitable to be used in your everyday transport life?	<input type="text"/> 1 <input type="text"/> 2 <input type="text"/> 3 <input type="text"/> 4 <input type="text"/> 5 <input type="text"/> 6
7. Does the pilot ease the use of public transport system?	<input type="text"/> 1 <input type="text"/> 2 <input type="text"/> 3 <input type="text"/> 4 <input type="text"/> 5 <input type="text"/> 6
8. Is the pilot able to convince people using public instead of private transport?	<input type="text"/> 1 <input type="text"/> 2 <input type="text"/> 3 <input type="text"/> 4 <input type="text"/> 5 <input type="text"/> 6
9. Click here for typing additional individual question!	<input type="text"/> 1 <input type="text"/> 2 <input type="text"/> 3 <input type="text"/> 4 <input type="text"/> 5 <input type="text"/> 6
10. Click here for typing additional individual question!	<input type="text"/> 1 <input type="text"/> 2 <input type="text"/> 3 <input type="text"/> 4 <input type="text"/> 5 <input type="text"/> 6
11. Please name further features of the pilot that you would like to be realized!	
12. Would you spend money for using the pilot to ease travelling with public transport?	<input type="text"/> Yes <input type="text"/> No
If you have answered question 12 with 'yes':	
12.1 How much would you spend approx. once for buying the pilot (service)?	
12.2 How much would you spend approx. monthly for using it?	
Comments:	

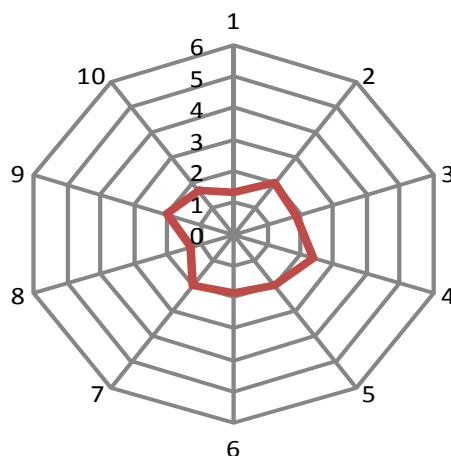
^{*)} Print questionnaire and ask pilot users for feedback!

Evaluation sheet of questionnaires (question 1-10):

question number	average value of answers			
1	1,3			
2	2			
3	1,9			
4	2,4			
5	2			
6	1,9			
7	2			
8	1,3			
9	2			
10	1,7			

Double-click: Fill in the
arithmetic average
values of all answered
questionnaires for
question 1-10 in the
yellow fields (overwrite
the given example
values) !

evaluation diagramm for pilot (quest. 1-10)



Evaluation sheet of questionnaires (question 11 and 12) - summarize users answers:

Question 11 - Further functionalities of pilot:

[Click here for typing!](#)

Question 12 - Spend money for pilot use (service):

number of

[Click here for typing!](#)

number of

[Click here for typing!](#)

‘YES’:

‘NO’:

Question 12.1 - Spend money once for buying pilot (service) - average value:

[Click here for](#) €
[typing!](#)

Question 12.2 - Spend money monthly for using pilot (service) - average value:

[Click here for](#) €
[typing!](#)

Comments:

[Click here for typing!](#)

Leader of Pilot: Describe your own experiences with the pilot and its testing phase with a special
focus on the pilot's use in the future:

[Click here for typing!](#)

Transition of Pilot Development to context of WP6 ‘Evaluation and Strategy Development’

What Critical Success Factors (s. below) played a role in deployment of the pilot?

(In order to assess the international transferability of the pilot, please indicate which factors played a critical role in the success or failure of the pilot. It is an open question and you are free to indicate a Critical Success Factor (CSF) or multiple, but the list below might give you some inspiration.)

--> What factors were decisive in the pilots success?

--> What factors were decisive in the pilots failure?

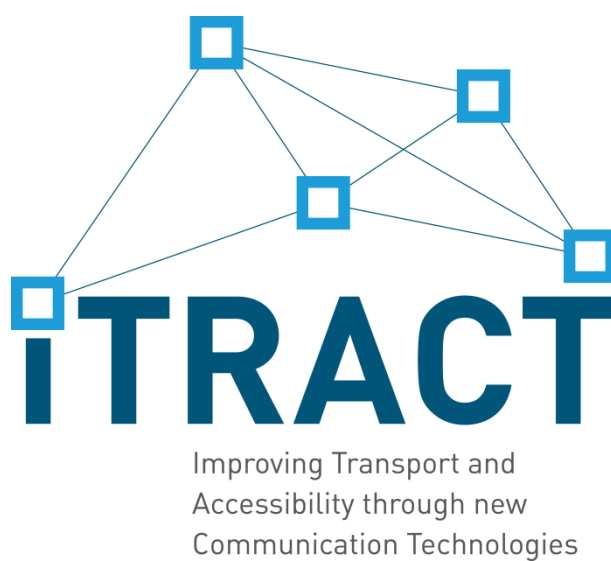
[Click here for typing!](#)

Possible Critical Success Factors (CSF) are:

- (mobile) broadband coverage throughout the area
- National/regional law and policy setting
- Budget
- Usability of pilot technology
- Service level in the area
- User persona (profile); commuter, day visitor, tourist, etcetera
- Knowledge of users
- Skills of users
- Attitude of users
- Aspirations of users
- (Reluctance of users)
- Physical mobility of users
- Smartphone and internet usage among users ('digital divide')

Comments:

5.2 Applications and their piloting



Applications and their piloting (WP 5)

January 2015

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1 Introduction

Improving Transport and Accessibility through new communication technologies (ITRACT) is a project funded by the European Union. The Interreg IVB and the EFRE programs have the focus on rural regions and their special needs. Involved in the ITRACT project are partners in the Netherlands, Great Britain, Norway, Sweden and Germany.

One of the main problems arising in rural regions is to provide the necessary infrastructure to give business, industry and citizens of a region an environment, where everyone can work and live in way that helps the region to flourish.

The possibility to get from one place to another even if you have no access to your own vehicle is an important goal. Therefore the public transport companies play a serious role in the mix of different activities that help to develop a region. In each region partners are involved that come from the public transport businesses of the region. After finding out which necessities the different regions have (image 1), several to-be-built applications have been chosen.

One obstacle that is often found if you ask people why they don't use public transport: They don't know enough about the bus stops, the bus schedules, the bus lines etc. This is the part where ITRACT helps.

Over 40 application prototypes have been developed and many of them are dealing with the problem to inform the customer of public transport properly.

- ▣ the applications have not only been developed but also tested (piloted) first under laboratory conditions
- ▣ second under real life conditions.
- ▣ there were also activities to empower the users of the applications to get a real benefit from the usage (image 2)

To make the real life test possible the public transport companies have been necessary. Therefore their umbrella organization VEJ (Verkehrsregion-Nahverkehr Ems-Jade) is a subpartner of the Jade University in the project.



Image 1: Innovation Workshop



Image 2: User Empowerment Workshop

At the end hopefully some of the tested application can change from prototype status to real working applications. The potential of the applications has been checked in a business innovation workshop.

The Jade University was responsible for the so called work package 5 which dealt with the applications and everything involved with it.

This brochure gives an overview over the different applications, what their focus is and the piloting phase of the applications. There is also a Best Practice Guide included at the end of the document.

More information about the different applications is available on the ITRACT platform⁶.

January 2015

Prof. Dr. Juliane Benra (project coordinator, Jade University)

⁶ <http://www.itract-project.eu>

2 Applications

Each of the 40 application is briefly introduced in this chapter. The order corresponds to the regions where the apps were developed. Additional information can be found in the respective organization models on Projectplace⁷.

2.1 Region Groningen

2.1.1 G1 “Step by Step”

Elderly people in the region Oost-Groningen will become more and more dependent on public transport, because of their age and because facilities (like hospitals, shops) are being relocated and at a greater distance than before. They are not used to public transport and don't know how it works. They need 'step by step' information and a very user friendly ICT solution, to help them before they are going to use public transport (e.g. planning a trip, finding departure times etc.) and while using public transport (e.g. where to get out of the bus, how to find the bus stop for the return journey etc.) Elderly people can get support for daily life issues at the so called Steunstee's or at the Wmo-loket⁸ of their municipality. There, intermediates can also help them in finding their way in public transport. The intermediates themselves are often not too well informed about public transport and will also need 'step by step' help and information in order to be able to help their clients. Goal: an app for tablet or smart phone to be used by an intermediate at a Steunstee or Wmo-loket and/or someone travelling by public transport. With help of the app a non-experienced traveler learns how to use public transport and improves his or her mobility.



Image 3: Step By Step Mobile App

⁷ https://service.projectplace.com/pp/pp.cgi/0/685406751?op=wget#/tab_docs
(WP5/Organization models for pilot development)

⁸ social supporting information desk at the local municipality

2.1.2 G3 “Get Connected”

In ITRACT the region of East Groningen gets special attention since it is a so called ‘krimpgebied’ (area with shrinking population). People who live and work there may have other wishes and priorities concerning public transport than for instance people in the city of Groningen. The main target group that is supposed to be using the information system, website or app is elderly people. They are learning to use new communication technologies and need very user friendly instructions. They get help from so called ‘intermediates’ at Steunste’s or employees of the municipal Wmo-loket, who are a secondary target group in this project. For (potential) users of public transport in East Groningen it is important to know which junction or major bus stops (“OV-knooppunt”) in their region provide connections to places inside and outside the region. Often one knows where the nearest bus stop is, the nearest railway station or the route that one usually takes, but not the possibilities beyond the familiar and easy connections to and from junctions of public transport.

Also, there is not always a public transport connection from the outside areas to a central junction or stop (relatively) close in the neighborhood. Opportunities for pre- and post-transport (to and from the nearest major station or junction) should be made more transparent and may be created by use of private ‘help’, where other users (e.g. ‘neighbors’) take care of the transport. This could be a ‘marketplace’ with people offering a ride or looking for transport to a bus stop or ‘knooppunt’. The information regarding the junctions is available on the information system, website or app; both travel opportunities and facilities (bicycle, covered bus stop, accessible stop, benches, DRIS etc.). The goal of the assignment is to create a situation in which (potential) passengers are better informed about travel opportunities, to and from the basic junctions in the region. Being better informed will encourage people to use public transport as one of the possibilities to improve and maintain their mobility, especially in a ‘krimpgebied’ like East-Groningen.

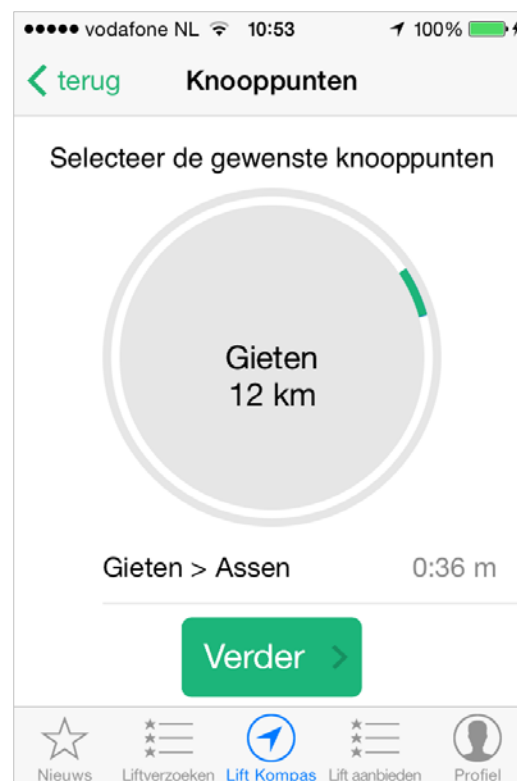


Image 4: Get Connected Mobile App

2.1.3 G5 “Tell us!”

The Public Transport Authority, in Groningen en Drenthe the OV-bureau, needs input from passengers to be able to improve the public transport in the region. In ITRACT the region of East Groningen gets special attention since it is a so called ‘krimpg gebied’ (area with shrinking population). People who live and work there may have other wishes and priorities concerning public transport than for instance people in the city of Groningen. We would like them to ‘tell us’ about that. The main target group that is supposed to be using the information system, website or app is elderly people. They are learning to use new communication technologies and need very user friendly instructions. They get help from so called ‘intermediates’ at Steunsteet’s or employees of the municipal Wmo-loket, who are a secondary target group in this project. The proposed information system, website or app makes the traveler’s ‘voice’ heard about his trip and his experiences while using public transport in East Groningen. This could be requests, constructive feedback, ideas, and real time feedback.



Image 5: Tell us! MockUp

OV-bureau already has a Digitaal Reizigerspanel⁹, with invitations send by e-mail and online questionnaires. A Tell us! information system, website or app (also) gives immediate feedback. The add-on on the developed app Tell us! would be that the input can be re-used as information on actual changes, delay’s etc. for travelling passengers. Passengers can read each other’s tips and (short) remarks on a notice board. There is interaction between the users of the information system, website or app. And off course, the OV-bureau needs to read the input and if necessary give a reaction.

⁹ <http://www.praatmeeoverhetov.nl>

2.1.4 G6 “Shuttle Drive Plus 1”

Develop mobile application for travelers between Bremen and Groningen. The target group is passengers and car drivers.



Image 6: Web Frontend

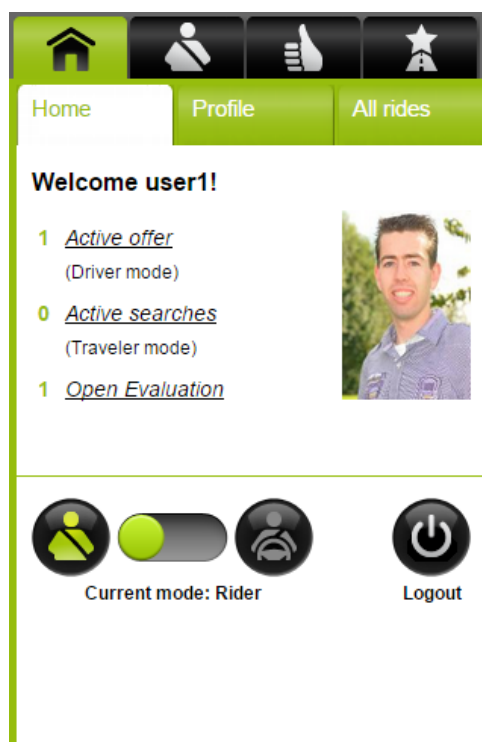


Image 7: Mobile Frontend

2.1.5 G7 “P+R Groningen”

Around Groningen City there are five P+R sites: P+R Haren/A28, P+R Euroborg/A7, P+R Kardinge, P+R Zernike, P+R Hoogkerk/A7. For the region, and specifically the ITRACT region East Groningen, it is essential to understand that important (and fun) destinations in the city (think e.g. of Martini Hospital, UMCG, shops, Groninger Museum) can be easily reached with a combination of car and bus with cheap or free parking. The P + R sites have stops for several bus lines. For the (potential) bus passengers it is not always clear which bus(es) they can take into Groningen City and with which bus(es) they can go back to the P+R site. Only P+R Haren has a recognizable bus (line 22). It is not always clear until what time the buses ride and at what time you really have to travel back to be able to pick up your car at the P+R site. Goal: To encourage and facilitate the use of P+R sites:

- ❑ clear and correct information
- ❑ overview of the P+R sites around Groningen (map, capacity)
- ❑ understanding which P+R site is best accessible from each direction (east, south, west, north) , with option for second best choice
- ❑ list of bus lines per P+R with stops and major destinations
- ❑ maps of the P+R sites with stops and bus numbers (platform map)
- ❑ arrival and departure times of buses per P+R
- ❑ signal for departure of the last bus (warning to the traveler)

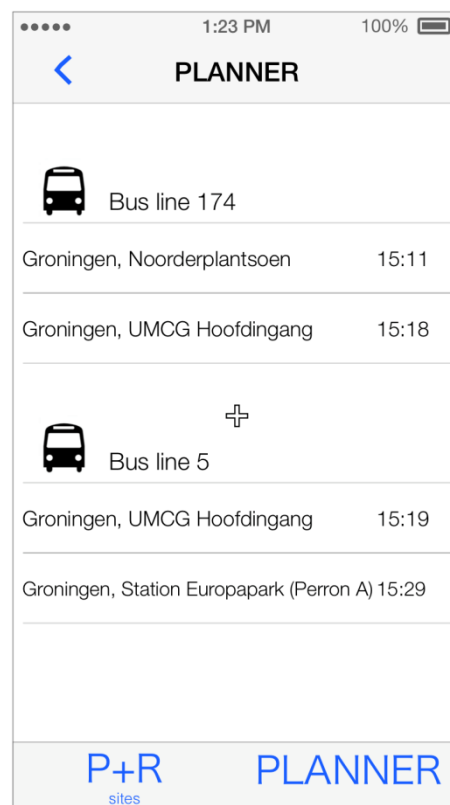


Image 8: P+R Mobile Planner

2.1.6 G8 / G9 “Scan and Go”

Scan and Go is an app that informs people about points of interest (museums, events) and how to get there by bus. After scanning a QR-code on a bus stop or poster the traveler can get a travel advice and information about the event or the POI. It shows different travel opportunities, the route on a map and it is possible to save trips and/or destinations for later use. Its goal is to help visitors and inhabitants of the region to find interesting places to visit and to help them to get there by bus. Indirectly it makes people to (re-)discover public transport in the region.

Applications:

- G8 App for iOS
- G9 App for Android

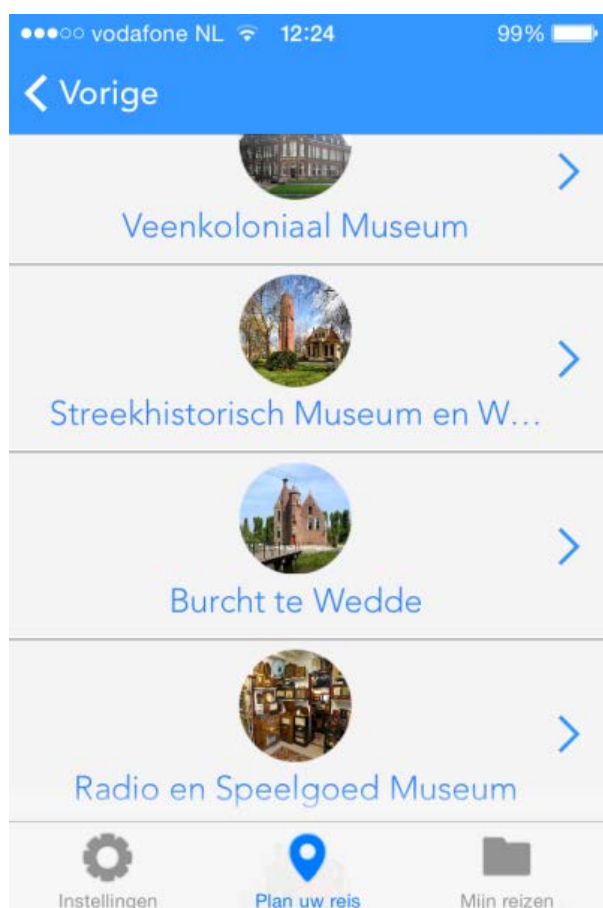


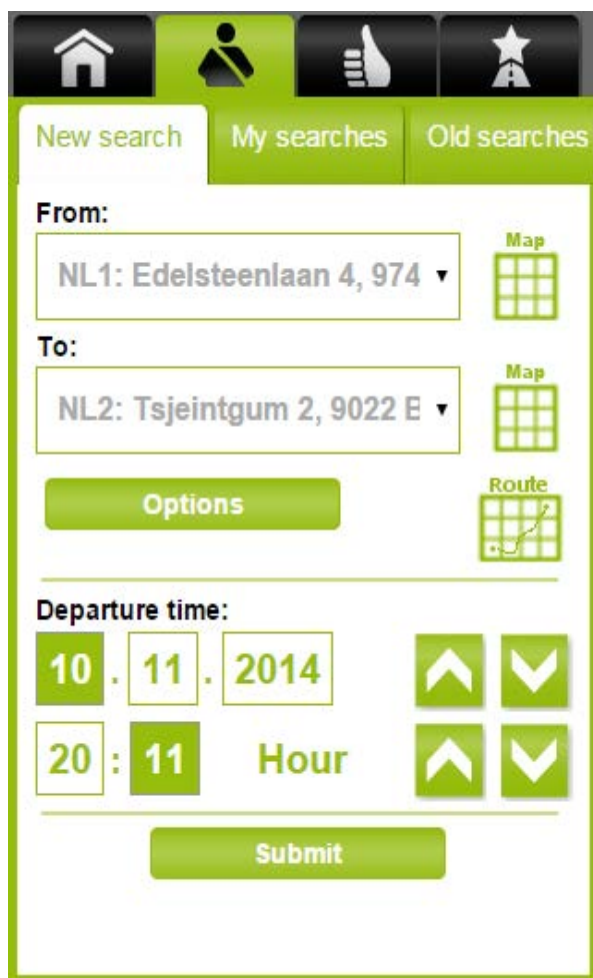
Image 10: Scan and Go POI Overview



Image 9: Scan and Go POI Details

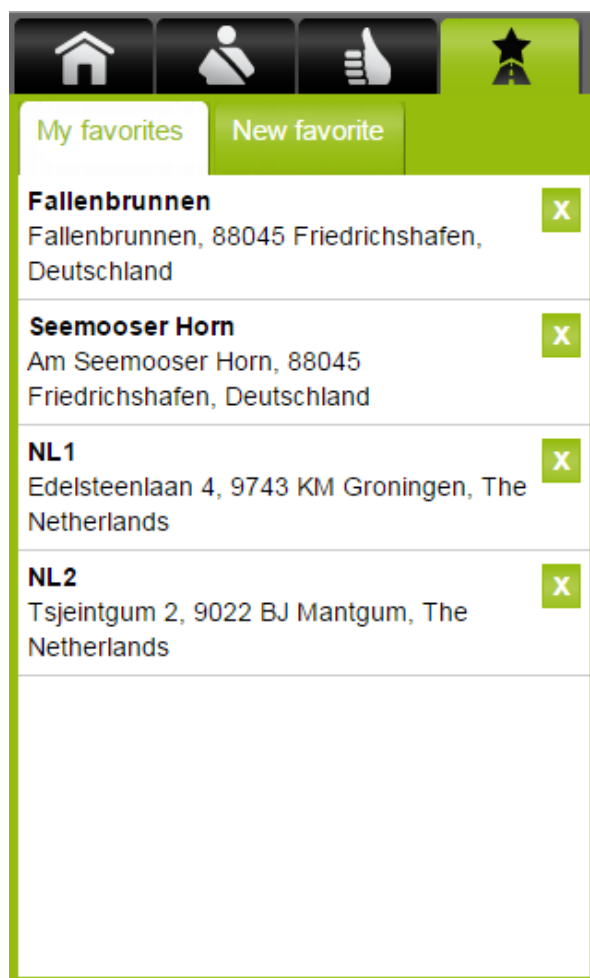
2.1.7 G10 “Shuttle Drive Plus 2”

Shuttledrive is a service which allows you to plan and search rides on mobile devices. You can check reputation and score of the driver or the traveler and if no match is found, you can switch to public transport. It makes use of the ITRACT platform and has many features like frequently used places, reputation management and automatic location detection!



The Mobile Search interface features a top navigation bar with icons for home, user profile, thumbs up, and a star. Below this is a tabbed menu with 'New search', 'My searches', and 'Old searches'. The 'New search' tab is active, showing a 'From:' field with 'NL1: Edelsteenlaan 4, 974' and a 'To:' field with 'NL2: Tsjeintgum 2, 9022 E'. Both fields have a 'Map' icon to the right. Below the fields is an 'Options' button and a 'Route' icon. The 'Departure time:' section includes a date picker set to '10 . 11 . 2014' and a time picker set to '20 : 11 Hour', both with up/down arrows. A 'Submit' button is at the bottom.

Image 12: Mobile Search



The Favorite Places interface has a top navigation bar with the same icons as the search screen. Below is a tabbed menu with 'My favorites' and 'New favorite'. The 'My favorites' tab is active, displaying a list of four favorite locations, each with a green 'X' icon to its right:

- Fallenbrunnen**: Fallenbrunnen, 88045 Friedrichshafen, Deutschland
- Seemooser Horn**: Am Seemooser Horn, 88045 Friedrichshafen, Deutschland
- NL1**: Edelsteenlaan 4, 9743 KM Groningen, The Netherlands
- NL2**: Tsjeintgum 2, 9022 BJ Mantgum, The Netherlands

Image 11: Favorite Places

2.2 Region Jade Ems

2.2.1 J1 “Real time data - GPS low cost”

The idea of this app is that a bus is tracked in real time and its position is sent to the smart phone where this application is running on. For tracking the bus a signal coming from the ticket machine inside the bus is used. Between two bus stops the ticket machine corresponds with the host computer in the control station of the public transport company via GSM-connection and reports the current position of the bus. With that feature the display inside the bus as well as the information via loudspeaker is controlled.

The app J1 uses this GSM-signal for tracking the bus and to forward this information to the smart phone of the application user. The advantage of this approach is that no additional hardware is needed. Moreover this procedure makes sense especially in urban regions as the distance between to bus stops is not that large as it is in rural areas.



Image 13: GPS Device

2.2.2 J2 “Check of monthly season tickets for pupils”

Target group of this pilot are ticket controllers from public transport companies. Bus tickets for pupils of the “Stadtwerke Wilhelmshaven” (public services Wilhelmshaven) with a limited period of validity (weekly, monthly) are equipped with a barcode that up to today is not used for any function. Using this new developed pilot the validity of the bus tickets can easily be checked from the ticket controller using his smartphone, running the application and scanning the barcode on the ticket.

Moreover it can be checked whether the user of the card is the real owner that means the ticket controller is able to get information whether a ticket is lost and found – what happens quite frequently – or even stolen. In this case a pupil gets a replacement card with another bar-code and the old card with the old barcode is locked. For that reason illegal use of the ticket can easily be prevented.

A database that is stored in the smartphone contains all data like names of the pupils, ticket types, validity periods and so on. As in rural areas the GSM-connection might be not covering the whole region it is required that the database is not transmitted via GSM instead it is stored in the smartphone of the ticket inspector. He has to update the database e.g. every morning when starting his working day, then the data is always up to date. The application can be used just with one single button to start the scanning process.



Image 14: Card Reading in Action

2.2.3 J3.1 “Online route network presenting bus lines”

In this app all busses within a certain region are integrated in a digital map (open street map OSM). With this application the user can easily find busses and departures times for his current position. This app is developed for the use on an iPhone and works with dynamic data that means is connected to Microbus, a planning software with which bus time tables are generated in Germany.

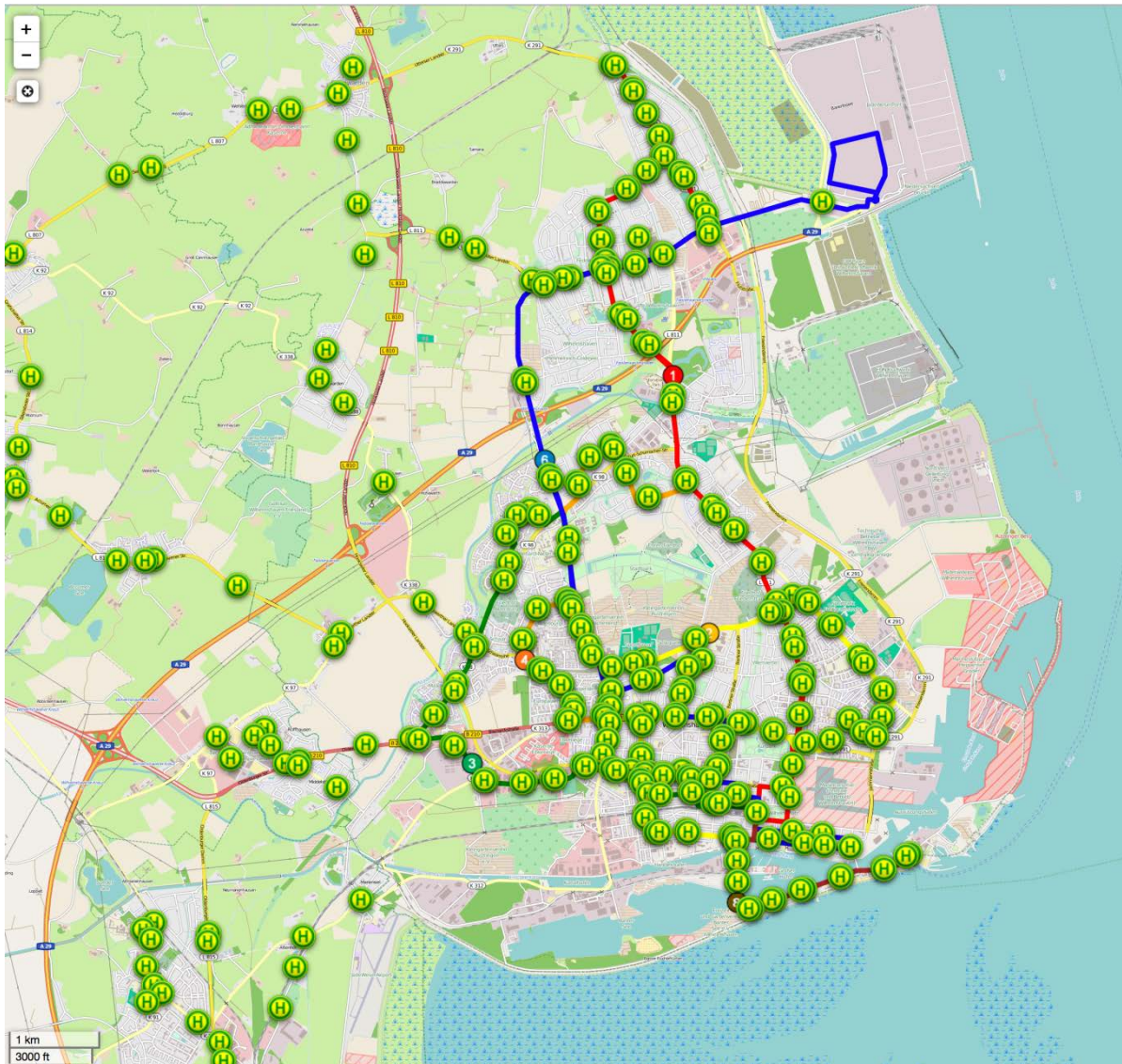


Image 15 : Webview of Wilhelmshaven Bus Stops

2.2.4 J3.2 “Online route network presenting stop information”

In this app all the timetable data and stop information’s of busses are integrated in a digital map (open street map OSM). With this application the user can easily find busses and departures times for his current position. This app is currently under development for the use on an iPhone. The app works with dynamic data that means is connected to Microbus, a planning software with which bus timetables are generated in Germany.

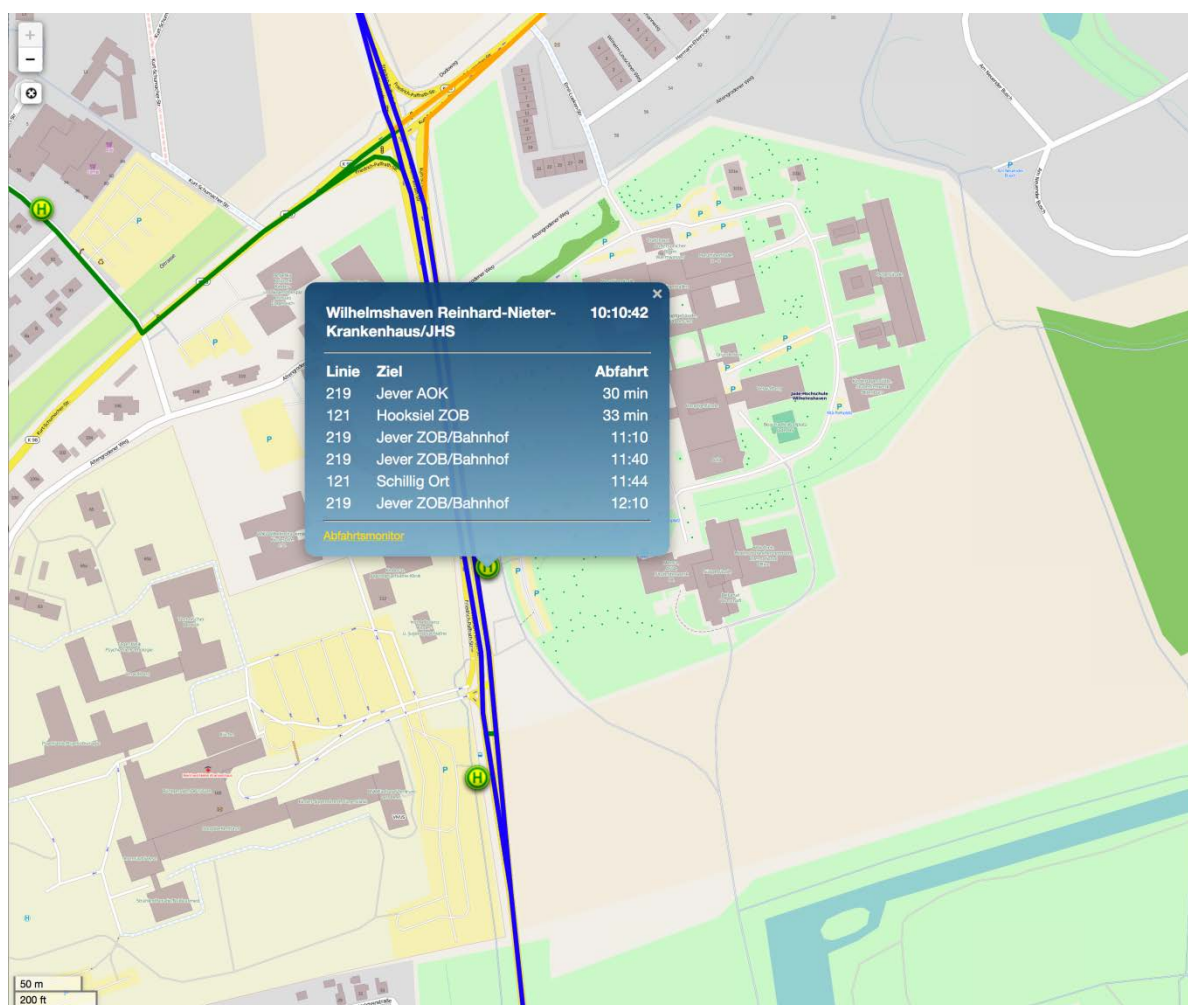


Image 16: Bus Plan at Jade Hochschule

2.2.5 J4.1 / J4.2 / J4.3 “Dynamic passenger information“

In this application a low cost LCD display is used to show the current time and real time departure data for the next buses. With this, bus stops in rural areas can be equipped with an indoor display, i.e. in a shopping window. This involves only a fraction of the costs for a normal outdoor display known from larger bus and train stations. This display consists of a LCD-display and works well (see Dynamic passenger information - display version 1, J4.2). Moreover the solution can also be used in other locations like hospitals or doctors’ offices.

Applications:

- ▣ J4.1 Low cost - smartphones
- ▣ J4.2 Display Version 1
- ▣ J4.3 Display Version 2

Wilhelmshaven Reinhard-Nieter-Krankenhaus/JHS		10:12:24
Linie	Ziel	Abfahrt
219	Jever AOK	28 min
121	Hooksiel ZOB	31 min
219	Jever ZOB/Bahnhof	58 min
219	Jever ZOB/Bahnhof	11:40
121	Schillig Ort	11:44
219	Jever ZOB/Bahnhof	12:10
121	Sengwarden Ort	12:54
219	Jever ZOB/Bahnhof	12:55
219	Jever ZOB/Bahnhof	13:19
219	Jever ZOB/Bahnhof	13:49

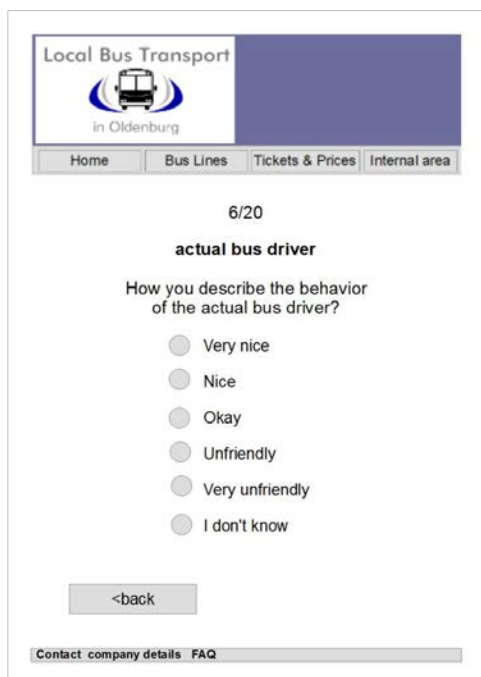
Image 17: Bus Plan Monitor at Jade Hochschule

2.2.6 J6 “Quality rating system”

The local transport service companies often do not know if the customers are satisfied with the services or how the services can be improved. An international group of students from Rezekne (Latvia), Klaipeda (Lithuania) and Germany (Wilhelmshaven) modeled a quality feedback application. Therefor they came together in a one-week workshop in Klaipeda.

The model includes various kinds of diagrams like use-cases, activity diagrams and class-diagrams. It gives an overview of the needed functionality and the possibility of realization. Its functionality and behavior was tested by a paper prototype. A first and rough proposal of the look and feel has been worked out. The modeled application gives the users of the local transport services the ability to give feedback to the transport company by the use of a questionnaire. Inside the bus users can find a unique QR-code. When the user scans the code, the homepage of a feedback site appears. The user can answer the questions of the integrated questionnaire and give a feedback to the transport company.

On the other hand side the local transport service company can analyze the answers in the backend of the tool. By the uniqueness of the QR-code it is possible to map what bus on which route got what feedback. A graphical representation of the answers is also included. The backend tool gives further the possibility to create the questions.



Local Bus Transport
in Oldenburg

Home Bus Lines Tickets & Prices Internal area

6/20

actual bus driver

How you describe the behavior of the actual bus driver?

☐ Very nice
☐ Nice
☐ Okay
☐ Unfriendly
☐ Very unfriendly
☐ I don't know

<back

Contact company details FAQ

Image 18: Example of a Visualized Question

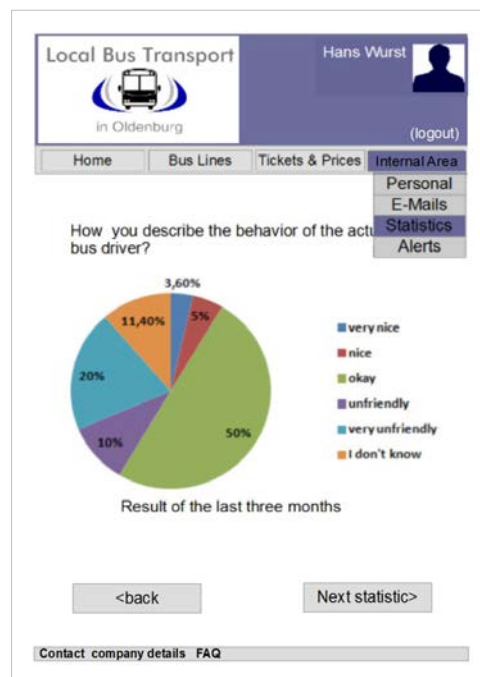


Image 19: Graphical Statistic Output

2.2.7 J16 “Hardware GPS low cost”

The idea of this app is that a bus is tracked in real time and its position is sent to the smartphone where this application is running on. This approach for realizing a real time bus tracking is a hardware solution: a GPS-receiver, a programmable logic-device in the form of a microcontroller and a 3G-modul that sends the data via an UMTS-connection is applied to the bus.

For the microcontroller an open source platform called Arduino is used which has the advantage to be free programmable what makes the hardware platform flexible for the use in ITRACT project.

This hardware (image 20) is attached into the existing system of the bus and works independently from the bus system. This solution is more suited for rural areas in comparison to the software solution (see Real time data - GPS low cost, J1).



Image 20: GPS Hardware

2.2.8 J18 “GTFS to PDF converter for timetables”

The basic idea of this app is a converter, which uses the centrally hosted GTFS data to generate a printable PDF timetable for a given bus stop. Because the PDF is generated on the fly it is always up to date. It also eliminates the tedious process of uploading all timetables for all bus stops to a web server to make them available for the public.

Target for this app are the public bus companies who can use the generated timetables for their bus stops as well as the customers who want a printed version of the timetable at the bus stop.

6

Wilhelmshaven Reinhard-Nieter-Krankenhaus/JHS

Nach: Kaiser-Wilhelm-Brücke / ZOB

	Montag - Freitag	Samstag	Sonntag / Feiertag
06	14, 34, 54 ₁	35 ₁	35 ₂
07	14, 34, 54 ₁	03, 33 ₁	
08	14, 34, 54 ₁	03, 33 ₁	
09	14, 34, 54 ₁	03, 33 ₁	02 ₁
10	14, 34, 54 ₁	03, 34, 54 ₁	02 ₁
11	14, 34, 54 ₁	14, 34, 54 ₁	02 ₁
12	14, 34, 54 ₁	14, 34, 54 ₁	02 ₁
13	14, 34, 54 ₁	14, 34, 54 ₁	03, 33 ₁
14	14, 34, 54 ₁	14, 34, 54 ₁	03, 33 ₁
15	14, 34, 54 ₁	14, 34, 54 ₁	03, 33 ₁
16	14, 34, 54 ₁	14, 34 ₁	03, 33 ₁
17	14, 34, 54 ₁	03, 33 ₁	03, 33 ₁
18	14, 34, 54 ₁	03, 33 ₁	03 ₁
19	14, 36 ₁	03, 33 ₁	02 ₁
20	13 ₁	23 ₁	02 ₁
21	02 ₁	02 ₁	02 ₁
22	02, 37 ₂	02, 37 ₂	02, 37 ₂
23	02 ₂	02 ₂	02 ₂

Image 21: Bus Plan generated from GTFS

2.2.9 J19 “QR-code supported timetables”

The basic idea here is to add a QR-code (which contains an URL) to the printed timetables, which are shown on the departure monitor built in J4.3. Customers then can scan this QR-code and are redirected directly to the departure monitor containing the next departures for the scanned bus stop. This is even more useful if real time data is added to the departure monitor.

For this application to work the users need to download a QR-code scanner which is available for free from different vendors.



Image 22: QR-code for the Timetable

2.2.10 J20 “Bus/taxi pool”

The local transport services in rural regions do often have the problem, that an economic carriage of passengers is impossible by following fixed timetables.

The online and mobile application “Bus and Taxi-Pool” could solve this problem. In many rural regions are several so-called local hubs where employees coordinate the maintenance of buses and cars. These employees are also responsible for the coordination of the busses and the bus drivers. In the local hubs exists a workplace that provides access to an electronic planning tool. This workplace has also a connection to the Internet.

The described application can be used to improve the public transport in rural areas. The idea is that passengers adjust their desire for transport in an online tool or an app via smartphone. The coordinator of a local hub coordinates the desired transports. The application gives a feedback to the passengers when and where they will be picked up.

An international group of students from Rezekne (Latvia), Klaipeda (Lithuania) and Germany (Wilhelmshaven) modeled a tool for a bus on demand service. The model includes various kinds of diagrams like use-cases, activity diagrams and class-diagrams. It gives an overview of the needed functionality and the possibility of realization. Its functionality and behavior was tested by a paper prototype. A first and rough proposal of the look and feel has been worked out.

The model of the application contains two parts. The first part, a frontend for the use of the passengers, is optimized for small displays as used in mobile devices. The second part (the backend for the local hub use) is optimized for a stationary use on personal computers at the local hubs.



Image 23: Mobile App



Image 24: Stationary App

2.3 Region Värmland

2.3.1 V1 / V2 / V3 “Smart Map“

This is a map that visualizes public transport vehicles, of various types and from different providers, in real time on the same map. Integrated in the travel planners of VTAB: in our mobile app (“Mobitime”) and on the web¹⁰.

Features:

- ▣ Show: Lines , Vehicles’ positions in real-time, Stops and stations (name of the stop, the lines serving the stop, and real-time information about these).
- ▣ Information about: Disturbances, Ticket sales etc.
- ▣ It should be possible to: Search trip (also by clicking on the map, for ex select a start position), Save “My trips” etc.

Applications:

- ▣ V1 App for Android
- ▣ V2 App for iOS
- ▣ V3 As web service

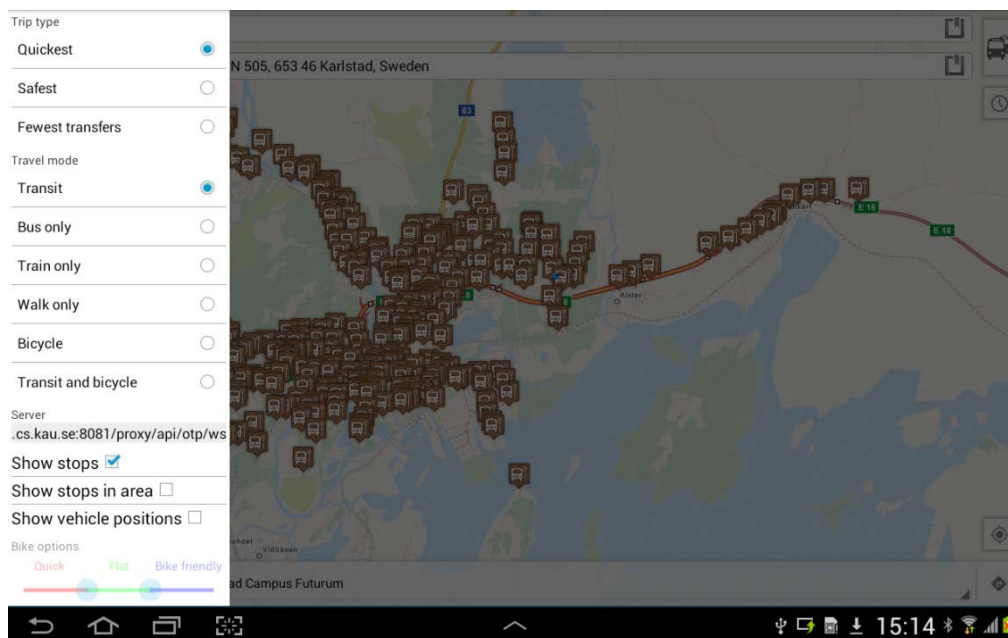


Image 25: Mobitime Realtime Overview

¹⁰ <http://www.varmlandstrafik.se>

2.3.2 V4 / V5 / V6 / V7 “Order On Demand Traffic”

On demand traffic has been used with great success in rural areas. Since it only runs when there are passengers, it is cost-efficient in areas where there are no great transport demands. Today VTABs customers have to call our travel booking central at least three hours in advance, and during our opening hours. It is not unusual that they have to wait in queue. This new service enables the customers to order timetable based on demand traffic by mobile app or on the web. They also get a response from VTAB that confirm that the trip is booked (SMS and/or mail).

Features:

- ❑ Integrated in our existing travel planners:
 - 1) our mobile app “Mobitime” and
 - 2) on the web
- ❑ Tailored to the user's needs (alarm function,”reminder-sms” etc.)
- ❑ Get confirmation from VTAB as sms or mail.

Applications:

- ❑ V4 in our existing mobile app for Android
- ❑ V5 in our existing mobile app for iOS
- ❑ V6 in our existing mobile app for Windows Phone
- ❑ V7 on the web



Image 26: Multi-platform Usability

2.3.3 V8 / V9 / V10 / V11 / V12 “Business Travel App”

This is a mobile service for business travel – integrated in Värmlandstrafik’s existing travel planner in our mobile app Mobitime. This service gives employees the possibility to pay for their work-related trips and get a ticket in their mobile phones. The employers get an invoice in the end of the month and have possibility to get statistics of the travelling of their employees. This service has three parts:

1. For the customers: the mobile app (in three versions: Android, iOS and Windows Phone)
2. For the company: a web account/log in for administration
3. For Värmlandstrafik: a web account/log in for administration

Features:

- Log in for authorized users/employees.

Applications:

- V8 for Android
- V9 for iOS
- V10 for Windows Phone
- V11 Web admin for employer
- V12 Web admin for VTAB

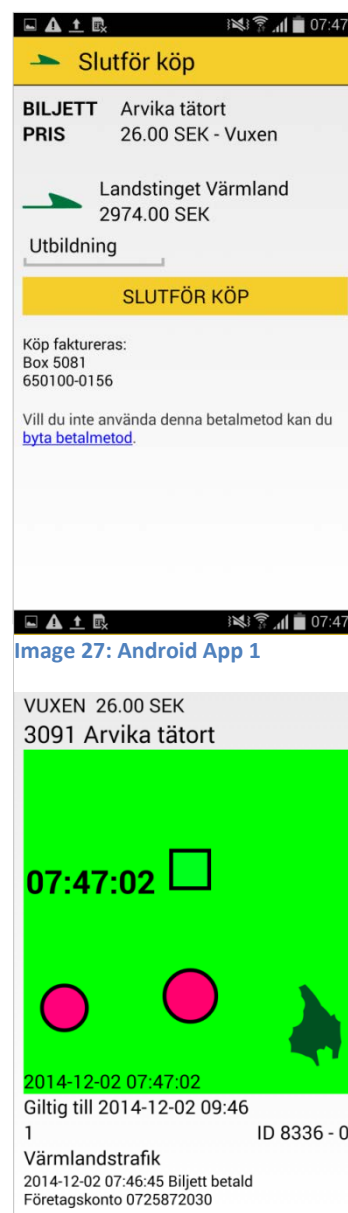


Image 28: Android App 2

2.3.4 V13 / V14 “Realtime mobile app / Travel planner on web”

Värmlandstrafik “Realtime” traffic app shows the realtime bus traffic movement, which can be monitored on a mobile optimized web app and a rich application desktop web page, which is also capable of planning travel routes.

Applications:

- ▣ V13 Realtime Mobile App
- ▣ V14 Travel Planner on Web

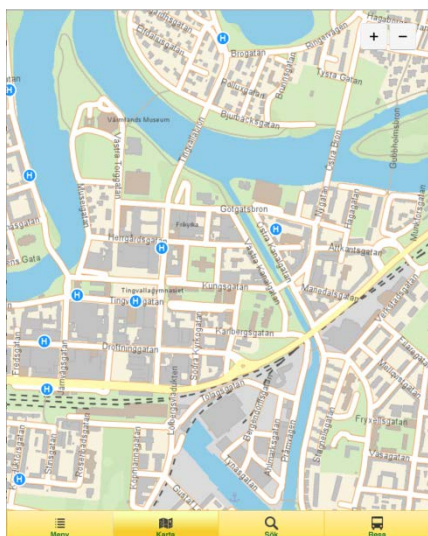


Image 29: Realtime Mobile App 1

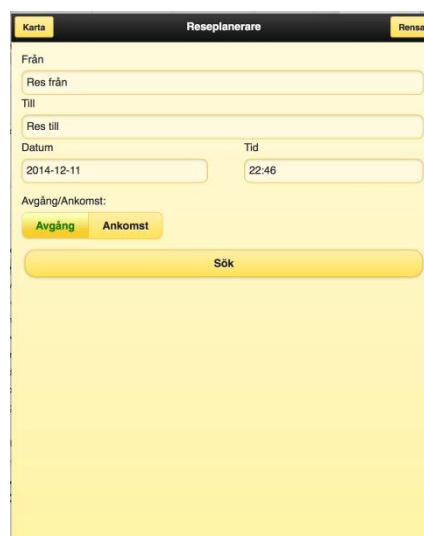


Image 30: Realtime Mobile App 2

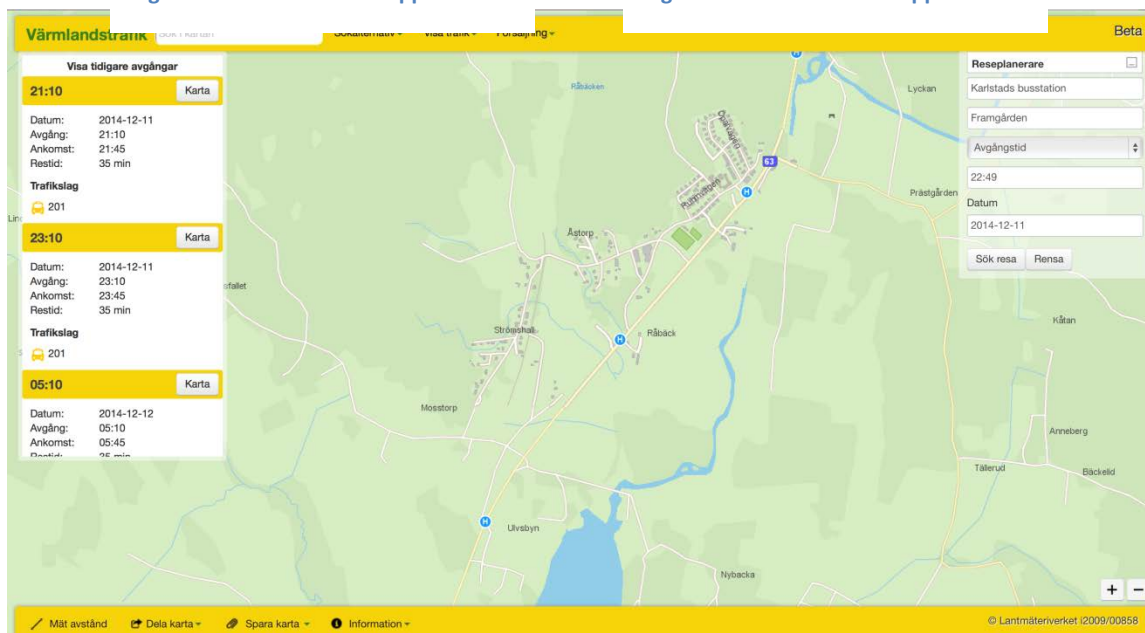


Image 31: Web Planner

2.4 Region Yorkshire Dales

2.4.1 Y1 “Transport Watch”

Transport Watch is a service allowing information to be uploaded by trusted individuals (hub volunteers and train/bus operators) initially and then published to the ITRACT Hub Dashboard concept, the DITA website and other twitter feeds. The service will be operated using Twitter to both gather and distribute travel updates; ease of use and near “no cost” means this is a perfect application to use for Transport Watch. The purpose of Transport Watch is to ensure that travel and transport disruption information is being recorded in the Yorkshire Dales and onwardly distributed to all key platforms (including “The Hub Dashboard”).

The pilot will take in information from all DITA hubs and key Dales based bus operators who will update a central Twitter account with travel disruption information. Whether this pilot is successful or not, depends on how much improvement can be added to each test subjects journey i.e. disruption avoided, alternative successful journeys made, etc. It will, therefore, be key to ensure all test users experiences are captured accurately to ensure using this new service has either positively or negatively affected their journey on a given day.

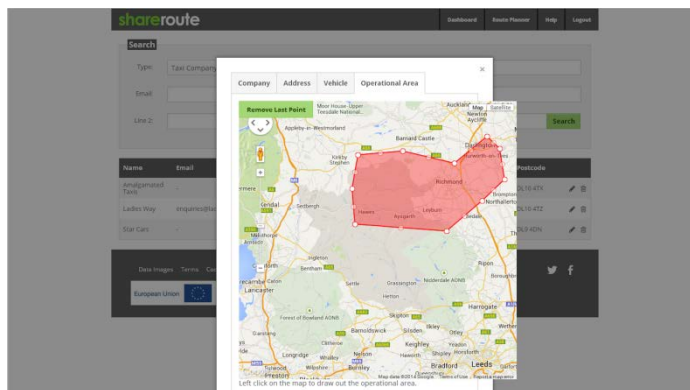


Image 32: Map Overview

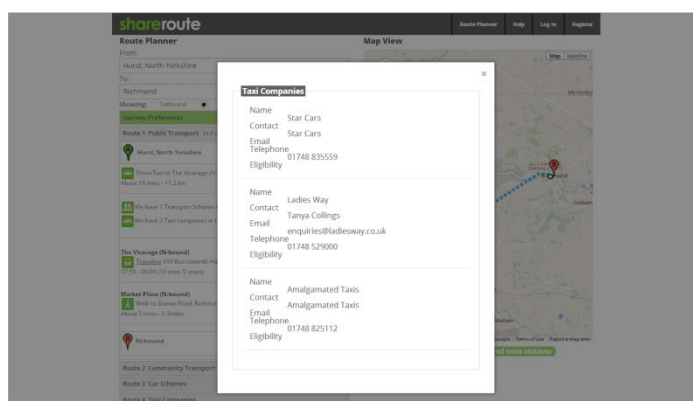


Image 33: Company Overview

2.4.2 Y2 “Hub Dashboard”

Several DITA (Dales Integrated Transport Alliance) “hubs” have been set up across the Yorkshire Dales to act as central points for transport and travel information to be relayed (amongst other reasons).

To combat the issue of low internet connectivity (both fixed and mobile) across the Yorkshire Dales, a screen will be configured to display key travel information (bus times, travel disruption news and weather) based on the hub location. This can provide a key focal point of travel information for visitors to the Dales who do not have access to these virtual services directly.

Dales 	Grassington National Park	11:02
Service	Destination	Time
72	Hebden	11:33
72	Skipton Bus Stn	11:40
72	Skipton Bus Stn	11:50
72R	Buckden	12:33
72R	Hebden	12:33
74	Ilkley Bus Station	12:40
72R	Skipton Bus Stn	12:50
72	Hebden	13:33
72	Skipton Bus Stn	13:50

Connecting people and places in the dales







Image 35: Dashboard 1

Dales 	Leyburn Market Place	11:01
Service	Destination	Time
159	Richmond Market PI	11:35
157	Bedale	11:42
157	Gayle	11:50
156	Gayle	12:30
159	Ripon	12:30
159	Richmond Market PI	12:42
159	Richmond Market PI	13:35
157	Bedale	13:42
156	Gayle	14:30

It's the sign that helps you get there... and back.



Just think of us as part of your community.

Call: 01969 622317
email: martin.crowson@virgin.net
www.dalesconnect.net/leyburn

Dales Haven
Market Place, Leyburn DL8 5BJ
Open: March – Oct open daily 10.30am – 4.30pm
Nov, Dec and Feb closed Weds and Thurs. Jan closed

ake the bus? Ask inside for more information.

Image 34: Dashboard 2

2.4.3 Y3 “Linking Demand Responsive to Journey Planner”

This pilot aims to demonstrate whether any benefits can be made when adding Demand Responsive information to existing Travel-Line or Transport Direct type journey planning websites or apps. Using existing “APIs” (Application Programming Interfaces), a connection will be made between the Community Transport Assistance application (developed in J11) and previously mentioned regional and national journey planning websites. Once in place this will allow an individual to make a connection to a scheduled service from a demand responsive option (or other community transport service) to make a complete journey.

Pilot services will be run in key areas of the Dales to show that improved mobility and accessibility can be achieved by making less standard services more visible to bus users i.e. you can catch a fairly regular service from Grassington but if you live 5 miles from Grassington you may want to use the a demand responsive service to ensure you make your connection.

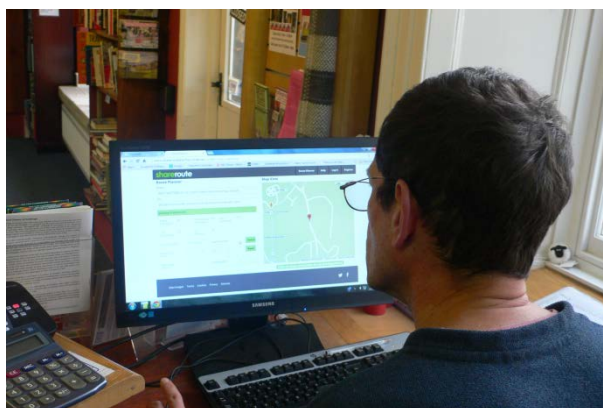


Image 36: Working with ShareRoute

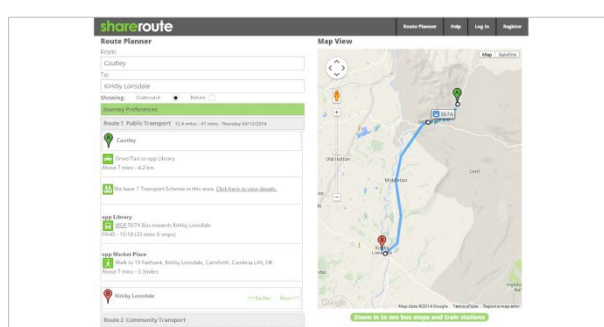


Image 37: Route Planner

2.4.4 Y5 “Car Link”

Utilizing the “Community Transport Assistance” software, being developed for “J11”, this pilot will demonstrate the benefits of integrating local car volunteer schemes and demand responsive services on one centrally managed IT system. Although very similar to the Community Transport Assistance pilot,

Car Links is specifically focusing on the inclusion of car pool and car sharing schemes to aid community transport services. What the UK partner hopes to demonstrate following the completion of this pilot is how effectively Car Pooling and Car Sharing can improve community transport provision, especially in the rural setting.

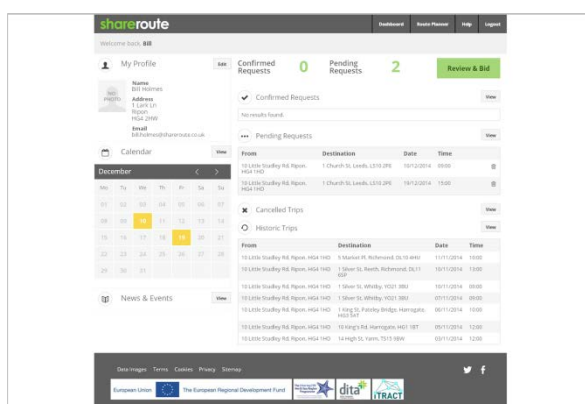


Image 38: Driver Details

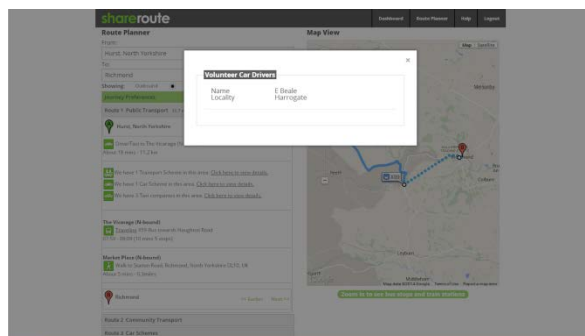


Image 39: Car Link

2.4.5 Y11 “Community Transport Assistance”

With the Dales hubs already created (by the Dales Integrated Transport Alliance) the UK ITRACT partner already have access to a suitable network of voluntary support offering transport and travel advice to both people living in and those visiting the Yorkshire Dales. A logical next step would be to provide a system for these volunteers that hold all types of vehicular (CT and Scheduled), trip and driver information to aid journey planning being made by visitors to the hub. Metro currently work with a company called Data Images who provide a system called “FlexiRoute” that manages a Dial-a-ride operation (Access Bus) across West Yorkshire. It is intended that work will start with Data Images to use a cut-down version of this system in a part of the Yorkshire Dales that will act as a pilot for ITRACT. The system will collect driver, vehicle and trip information to allow the formation of voluntary car and demand responsive services which could be managed from the Dales hub.

The way the system has been developed means there may be the chance to then connect up newly formed CT services with scheduled services (using API’s provided by TraveLine and TransportDirect.gov.uk). This system would initially be of use to residents based around the hub location; people would most likely need to be set-up on the system should they want to use the service which may not fit into a “day-trippers” itinerary. As this system is “cloud” based, that is to say the system is accessible over the web, a user should have the ability to gain access from multiple locations.

Once development is completed it is expected that a pilot will be run from a key DITA hub with up to 16 vehicles and numerous patrons for at least 6 months. This should provide enough data to gauge how successful a full-scale install would be across more hubs. It is worth noting that this development will also provide development for both Y3 and Y5.

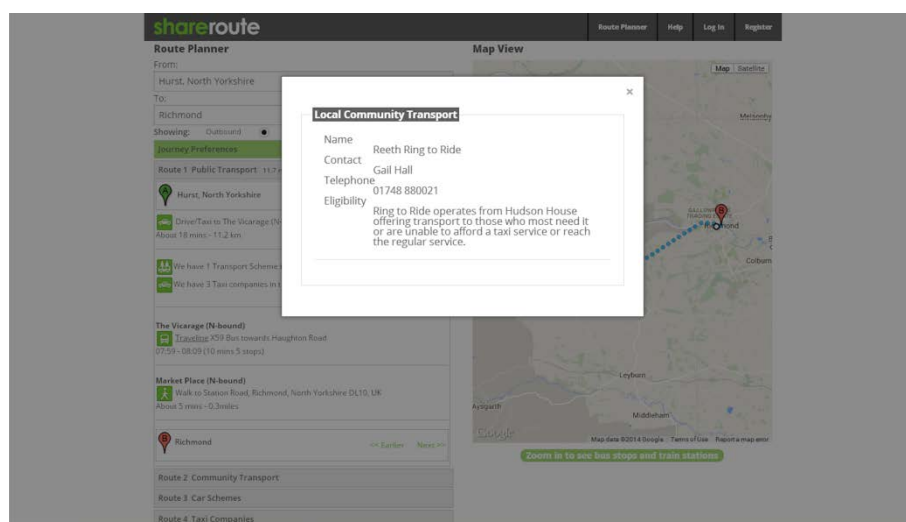


Image 40: Local Community Transport

2.4.6 Y12 “Real Time Bus Departures”

One of the services run by Metro in partnership with VIX Acis (telematics software provider) is to process information broadcast by Smart ticketing devices on buses and provide Real departure times across West Yorkshire. It is now Metro’s intention to extend this service to several bus companies who operate scheduled services across the Yorkshire Dales e.g. Pride of the Dales and Dales and District (Proctors). This provides the ITRACT UK partner with far more real time information adding value to the Hub Dashboard and various freely available Smart Applications e.g. Bus Scout and Moovit. The pilot will focus on areas surrounding Grassington and Leyburn (Wensleydale and Swaledale respectively).

Real Time will provide bus patrons with an accurate time for when their bus will depart. This is a major advantage in the Yorkshire Dales where an individual can travel for quite a distance, often in poor conditions, before reaching a bus stop. In this situation it is important for the bus user to have confidence in the actual bus time and not just static bus schedule information.



Image 41: Bus Monitor

2.4.7 Y13 “ShareRoute for Smartphones”

This App will provide a version of the ShareRoute journey planner/trip booking system to work on any Smartphone or tablet device with the interface adjusting to fit the size of the device’s screen. ShareRoute for Smartphones will provide a journey planner incorporating demand responsive, community transport and taxi operators alongside scheduled bus, train and coach services. Many small communities in the Dales are not served by scheduled public transport, and people who live there need non-scheduled transport at the beginning and/or end of their journey to reach the nearest public transport hub.

The system will make it easier for people, whether locals or visitors, to find information and booking details for local community transport schemes, taxis and volunteer car schemes, and even to make bookings directly using the software. ShareRoute for Smartphones will allow registered passengers to make and manage bookings on community car and demand responsive transport services using their smartphone or tablet device from any location, and allow drivers of those schemes to accept and manage their bookings.

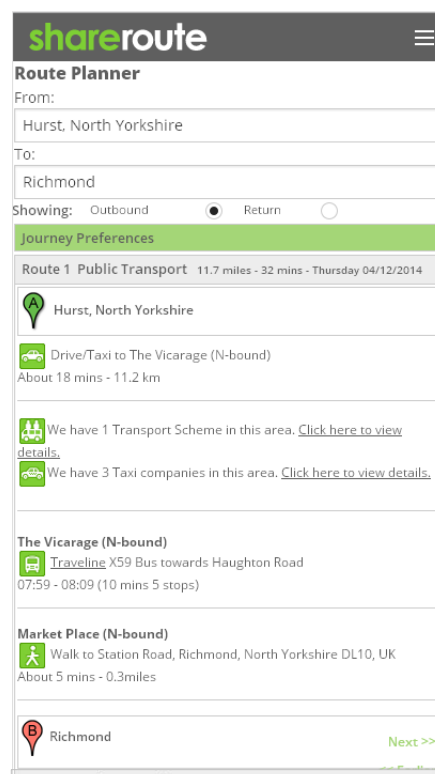


Image 42: ShareRoute Mobile App

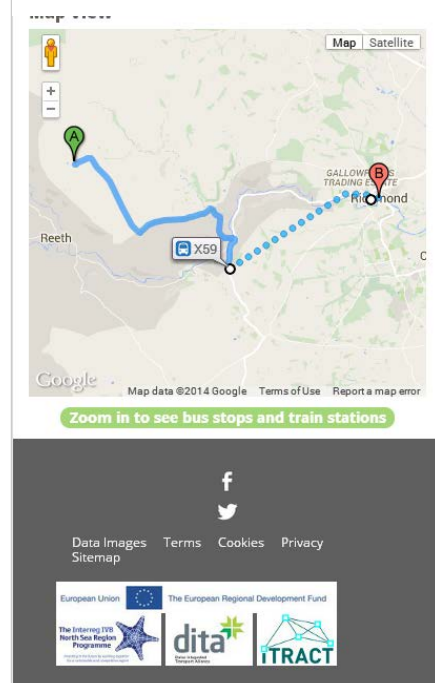


Image 43: Mobile Map View

3 Best Practice Guide

Below the Best Practice Guides from the Jade University are exemplified.

3.1 Best Practice for Application J2

1. TITLE OF THE APPLICATION/PILOT THAT IS THE "BEST PRACTICE":

Check of monthly season tickets for pupils (J2)

2. SHORT SUMMARY OF THIS BEST PRACTICE APPLICATION:

The target users of this pilot are ticket conductors from public transport companies. Bus tickets for pupils of the Stadtwerke Wilhelmshaven (public transport company in Wilhelmshaven) with a limited period of validity (monthly, yearly) are originally equipped with a barcode that up to the influence or the ITRACT project was not used for any function. Using the newly developed application/pilot the validity of the bus tickets can be easily checked by the ticket conductor using his smartphone, running the application and scanning the barcode of the ticket. By comparing the ticket number with an build in database it can be determined if the ticket is still valid and belongs to the pupil (by comparing the photo from the database) If a ticket is lost and found – what happens quite frequently – or even stolen, a new ticket with an different number can be issued and the old ticked is deleted from the database, thereby invalidated. For that reason the illegal use of a ticket can easily be prevented. The database that is stored in the smartphone contains all data like names of the pupils, photos, ticket types, validity periods and so on. As in rural areas the GSM-connection might be not covering the whole region it is required that the database is not transmitted via a GSM network, instead it is stored on the smartphone of the ticket conductor. He has to update the database e.g. every morning when starting his working day by using a specially shielded Wi-Fi network to keep the data up to date. The application can be used with just one single button to start the scanning process.

3. USERS/ORGANIZATIONS THAT USE THIS BEST PRACTICE APPLICATION UP TO TODAY - WHAT KIND OF USERS/ORGANIZATIONS MAY USE THIS APPLICATION ALSO?

The mobile application "Check of monthly season ticket of pupils" has been developed in close cooperation with the Stadtwerke Wilhelmshaven (public transport company, Wilhelmshaven). The ticket conductors of the Stadtwerke Wilhelmshaven represent the user group for this application The application/pilot was delivered to the Stadtwerke and a short introduction to its use was given to the ticket conductors. The database containing all the related data from pupils is stored on the ticket conductor's smartphones and can be updated by a private network for privacy reasons.

Any public or private transport company that has a barcode label on their long-term tickets and a database that contains all the relevant customer data can use this application.

4. HOW WIDELY DEPLOYED IS THIS BEST PRACTICE APPLICATION UP TO TODAY?

The application has been fully developed, it runs in real life conditions at the Stadtwerke Wilhelmshaven up to today for a time period of >1 year i.e. the application has demonstrated its usefulness and performance. A second version of the applications has already been developed which uses a newer version of the smartphones operating system (iOS7) and adds some features (i.e. search for pupil's names in the database). This version will be released this year in summer with the beginning of the new school year, because the underlying database structure has changed slightly and it would have been too time-consuming to convert the old one.

5. WHAT INFORMATION AND SUPPORT HAS WORKPACKAGE 5 (JADE UNIVERSITY) PROVIDED TO ENSURE THAT THIS BEST PRACTICE APPLICATION (OR IN GENERAL: EVERY ITRACT APPLICATION) BECOMES SUCCESSFUL?

Organizational Model for Pilot Development:

The template of this model was created by Jade University and shared within the whole ITRACT project. The model has to be created for every pilot in the project as it supports the systematic process of application development and as it concentrates the main information concerning each application/pilot. It consists of the four steps 1. pilot definition, 2. pilot implementation, 3. pilot testing and 4. pilot evaluation. The model has been stored on ProjectPlace (a web based project monitoring tool) as a template so that every project member has access to it. Moreover an exemplary filled out model has been created and shared to show the ITRACT partners the way to fill out the model. The model helps the developer to remember all the important steps of software development and the necessary interaction with the other project partners. The model has been created in close cooperation with workpackage 4.

Monitoring Excel sheet:

An Excel-based monitoring sheet has been created by Jade University to monitor the current status of application development approx. every two months. The different regional coordinators were frequently requested to define their current work progress (in percent) and the estimated finish date for each application/pilot. The monitoring sheet has always been updated in ProjectPlace to make the current status of the applications visible for everyone. This monitoring sheet was an important paper to ensure that the project indicators of the ITRACT project will be fulfilled.

Skype meeting:

Regular Skype meetings between the regional coordinators of each public transport company organized by Jade University helped to share information between the project partners, to discuss problems and ideas, to arrange the exchange of applications and pilots between the regions and to inform about new strategies and procedures in the ITRACT project.

Organizational Model for Usability testing:

A checklist for usability testing during the development was created by Jade University and shared within the whole ITRACT project. The checklist has been stored in ProjectPlace (web

based project monitoring tool) so that every project member has got access to it. The checklist helps the developer to remember all the important criteria of software usability, interaction and dialog design. In a second step the developers were asked to send their applications to Jade University for an eye tracking test.

6. WHAT INTERACTIONS BETWEEN THE DIFFERENT ITRACT PARTNERS WERE NECESSARY TO MAKE THIS BEST PRACTICE APPLICATION BECOME SUCCESSFUL? WHAT KNOWLEDGE AND SKILLS FROM PROJECT PARTNERS WERE REQUIRED?

none

7. PAIN POINTS - WHAT ARE THE USERS/ORGANIZATIONS TRYING TO IMPROVE WITH THIS APPLICATION?

Public or private transport companies who use this application can ease the process of checking the validity of tickets not only from pupils but also from any other kind of frequent traveler that holds a long-term ticket. Redundancies like the status or the validity of a ticket in the customer related database could be avoided by a streamlined workflow from applying for a ticket until the issuing of a ticket. Ticket conductors have nearly real-time access to the database. And thereby the most current data.

8. BENEFITS ACHIEVED - WHAT ARE THE CONCRETE RESULTS FOR THE USERS/ORGANIZATIONS WHEN IMPLEMENTING THIS BEST PRACTICE APPLICATION?

Benefits for the companies: see 3.

Moreover the use of a commercially available smartphone running the developed application is much cheaper than the use of specially developed hardware.

Benefits for the users (of public transport): Users of long-term tickets at Stadtwerke Wilhelmshaven (e.g. pupils) can easily get a new ticket when they e.g. have lost their ticket. If a pupil forgot his ticket the conductor can look up his/her name in the database and by looking at the photo determine if he/she holds a long term ticket thereby avoiding a fine for the passenger.

9. WHAT ARE THE HIGHLIGHTS OF THIS BEST PRACTICE APPLICATION?

This application uses a very easy to handle graphical user interface, which provides easy access to the main features of the application: update database, search database and scan barcode. That means that even if ticket conductors have little to none contact to modern information and communication technologies can use this application.

Another technical highlight of this mobile application is that the effort for using it is quite low: the ticket conductors just need to have a commercially available smartphone that is equipped with the application. The access to the database that is needed for checking the tickets is realized via

a Wi-Fi network connection. This eliminates the need for GSM network coverage, which can be poor especially in rural areas. Furthermore it avoids exposure of sensitive personal data i.e. name and photo of the pupils to public networks.

10. INTEGRATION OF INTERESTED USERS/ORGANIZATIONS IN THE DEVELOPMENT PROCESS - DOES THE USERS/ORGANIZATIONS HAS BEEN PART OF THE DEVELOPMENT PROCESS?

The Stadtwerke Wilhelmshaven has been part of the developing process right from the beginning of the ITRACT project. They have defined the features of this application as they were highly interested in a smartphone based solution for checking the validity of tickets. In close collaboration we developed a new workflow for applying and issuing the long term tickets aiming to minimize the work needed. Feedback from the ticket conductors using the first version of the application was used to develop a second version which adds some features and made the application more robust.

11. ORGANIZATIONAL REQUIREMENTS - HOW MUST A USER/ORGANIZATION BE STRUCTURED TO IMPLEMENT THIS BEST PRACTICE APPLICATION?

The long-term tickets of the public transport companies need to be equipped with a unique number. This number can then be scanned by means of barcodes or QR-codes. The application can be easily adopted to use different codes. Second a database is needed which stores customer related data (name, photo, school ...) and links the customer to just one card number. For this backed system we used only open source software components, so there are no costs involved. Third a protected Wi-Fi network is needed so the ticket conductors can synchronize their smartphone database with the central database. Access to this network must be restricted to the ticket conductors only to protect the sensitive user information's.

12. EFFORT FOR IMPLEMENTATION - HOW MUCH TIME AND MANPOWER IS REQUIRED TO IMPLEMENT THIS BEST PRACTICE APPLICATION? DO INTERESTED USERS/ORGANIZATIONS HAVE TO ARRANGE A (COMPLEX) PROCEDURE TO ADAPT THE APPLICATION TO THEIR NEEDS OR IS THIS BEST PRACTICE APPLICATION "READY TO START"?

The transport company needs a database with all the passenger relevant data. The public transport company can maintain this database using an open source web front end, i.e. PHPMYAdmin or by developing a custom web front end themselves. Hosting the database and the web front end is a so-called LAMP server, which is available preconfigured. The database can then be transmitted to the mobile device of the ticket conductor via a protected Wi-Fi network.

The passenger just needs a ticket with a unique barcode.

13. SUCCESS FACTORS - WHAT FACTORS ARE REQUIRED TO HAVE A POSITIVE AFFECT ON THE OUTCOME OF THE IMPLEMENTATION (E.G. MOBILE BROADBAND COVERAGE, KNOWLEDGE AND SKILLS OF USERS, ATTITUDE OF USERS, SMARTPHONE AND INTERNET USAGE AMONG USERS, ETC.)?

The critical success factors are quite low. The users of this mobile application just need a very brief training to work with this application properly. Mobile broadband coverage is not necessary because the syncing is done via a Wi-Fi network. Users of public transport do not have to use this application themselves.

14. SYSTEM SUPPORT - WHAT TRANSACTIONS OR PROGRAMS ARE REQUIRED FOR THIS BEST PRACTICE APPLICATION TO WORK?

For the backend system a LAMP (Linux, Apache, MySQL and PHP) server is needed. It can be downloaded for free because it's open source. For running the application itself an iPhone with iOS5 to iOS6 (version 1 of the app) or iOS7 (version 2 of the app) is needed. Because we choose to make the application not available in the iTunes App-Store the user needs to compile it himself and therefore needs to be a member of the Apple Developer Community to gain access to the necessary SDK from Apple. The costs for this membership are about 100 Euro per year.

15. HOW WAS THE PRACTICAL USE OF THIS BEST PRACTICE APPLICATION TESTED - HOW WAS ITS FUNCTION CONFIRMED?

The ticket conductors of the Stadtwerke Wilhelmshaven tested this application/pilot for about one year under real life conditions. A questionnaire was conducted to gain feedback on the usefulness of the application and the wishes of the users. The results were used to implement a second version which addresses some shortcomings of the first version. This version will be rolled in the summer of 2014.

16. WHAT ARE THE CRUCIAL FACTORS THAT MAKE THIS BEST PRACTICE APPLICATION HIGHLY USABLE?

This app has been developed in cooperation with the people who are using it right now in their daily work. Therefore it is highly accepted by the users.

The bus company can make sure with this application that it is not possible to use a stolen or found ticket and therefore there will be no more economical lost for the company.

For the students perspective it is very comfortable to be sure to make clear that they have a correct ticket even if they have forgotten/lost their original ticket and this is possible because of the immediate update of the necessary information for the ticket conductors.

17. WHAT ARE THE CRUCIAL FACTORS FOR MAKING THIS BEST PRACTICE APPLICATION HIGHLY SUCCESSFUL FROM A PUBLIC RELATIONSHIP PERSPECTIVE?

The crucial factors for making this best practice application highly successful from a public relations perspective is that for all involved persons there lie only benefits in this application: It is more comfortable as well for the conductors as for the students. The usage of modern smart phones for conducting purpose also gives the bus company a more modern image in the view of the public.

18. WHAT ARE THE CRUCIAL FACTORS THAT MAKE THIS BEST PRACTICE APPLICATION INTERESTING FOR TOURISTIC ISSUES IN THE REGIONS?

none

3.2 Best Practice for Applications J3.1 / J3.2 / J18

1. TITLE OF THE APPLICATION/PILOT THAT IS THE "BEST PRACTICE":

Online route network - presenting bus lines (J3.1, J3.2)
GTFS to PDF converter for timetables (J18)

2. SHORT SUMMARY OF THIS BEST PRACTICE APPLICATION:

J3.1, J3.2: In this application all busses within a certain region are integrated in a digital map using OpenStreetMap. With this app the user can easily find busses and departures times for his current position. This app is currently under development for the use by any smartphone. The platform independence is based on the fact that we use standard web technologies. The app handles data derived from Microbus, a planning software which generates bus schedules in Germany. These data is converted to the GTFS (General Transit Feed Specification) format, which all ITRACT partners agreed to use in their developments.

J18: The basic idea of this app is a converter, which uses the centrally hosted GTFS data to generate a printable schedule in PDF format for a given bus stop. Because the PDF is generated on the fly it is always up to date. It also eliminates the tedious process of uploading all timetables for all bus stops to a web server to make them available for the public after a schedule change. Target for this app are the public bus companies who can use the generated timetables for their bus stops as well as the customers who want a printed version of the schedule at the bus stop.

3. USERS/ORGANIZATIONS THAT USE THIS BEST PRACTICE APPLICATION UP TO TODAY - WHAT KIND OF USERS/ORGANIZATIONS MAY USE THIS APPLICATION ALSO?

This application can be used by everybody who plans to use public transport services to get from A to B. The application is easy to handle so that every person who has a smartphone or any other mobile device (i.e. tablet) can use it, special skills are not required (see 14.). The application can be used by travelers who seldom use public transport and also by commuters who uses the bus regularly for getting to work or for leisure activities. Because of the usage of the GTFS format the application can be easily adopted to other regions. To facilitate this even further all language specific text are inside an easily editable file.

4. HOW WIDELY DEPLOYED IS THIS BEST PRACTICE APPLICATION UP TO TODAY?

The applications (J3.1, 3.2, J18) has finished development and are combined into one single mobile app running on different mobile platforms (Android, iOS, etc.) as it has a web based software architecture using HTML5 and JavaScript. It is based on OpenStreetMap and covers the northwestern part of Germany with currently approx. 3500 bus stops. Also the converter from GTFS data to a PDF document runs properly for the above named region. Instances of the developed software are also used with GTFS data from Sweden and the Netherlands.

5. WHAT INFORMATION AND SUPPORT HAS WORKPACKAGE 5 (JADE UNIVERSITY) PROVIDED TO ENSURE THAT THIS BEST PRACTICE APPLICATION (OR IN GENERAL: EVERY ITRACT APPLICATION) BECOMES SUCCESSFUL?

Organizational Model for Pilot Development:

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Monitoring Excel sheet:

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Skype meeting:

Regular Skype meetings between the regional coordinators of each public transport company

organized by Jade University helped to share information between the project partners, to discuss problems and ideas, to discuss the exchange of applications and pilots between the regions and to inform about new strategies and procedures in the ITRACT project.

Organizational model for Usability testing:

A checklist for usability testing during the development was created by Jade University and shared within the whole ITRACT project. The checklist has been stored in ProjectPlace (web based project monitoring tool) so that every project member has got access to it. The checklist helps the developer to remember all the important criteria of software usability and the interaction and dialog design. In a second step the developers were asked to send their applications to Jade University for an eye tracking test. A feedback helps the developer to optimize their application.

6. WHAT INTERACTIONS BETWEEN THE DIFFERENT ITRACT PARTNERS WERE NECESSARY TO MAKE THIS BEST PRACTICE APPLICATION BECOME SUCCESSFUL? WHAT KNOWLEDGE AND SKILLS FROM PROJECT PARTNERS WERE REQUIRED?

Early in the ITRACT project all involved partners agreed to use the common and well tested data format – GTFS. Providing the data in this format was the foundation to develop exchangeable applications between the different regions. So each partner had to write a conversion program to transform the proprietary data format from the respective region to GTFS.

7. PAIN POINTS - WHAT ARE THE USERS/ORGANIZATIONS TRYING TO IMPROVE WITH THIS APPLICATION?

Organizations like public transport companies can ease the process for their customers to find valid and up-to-date timetable data from every bus stop they are interested in. Due to the fact that many people do not travel with public transport, as they may not be able to read bus stop timetables with many exceptions shown only with tiny footnotes. Also they may not be able to read the usually small print on the schedules. This problem is addressed with a so-called departure monitor, which just shows the next bus departures and the final bus stop on the route. The transport companies expect to get more customers and travelers with this app.

8. BENEFITS ACHIEVED - WHAT ARE THE CONCRETE RESULTS FOR THE USERS/ORGANIZATIONS WHEN IMPLEMENTING THIS BEST PRACTICE APPLICATION?

Benefits achieved for users:

"Not on Sunday", "Not on 24.12. and 25.12.", "Only from 6am to 11 am" etc.: everyone knows the information given on timetables via footnotes. Users of this application do no longer get in trouble with studying bus timetables like this. Instead they can create a link or a bookmark to this application on their smartphone for the bus stop they use the most and then they get current and valid timetable information whenever they need. This link can also be added to the presented schedule at the bus stop via a QR-code and then used by anyone who has a smartphone with internet connection.

Benefits achieved for the public transport companies (organizations):

The General Transit Feed Specification (GTFS) defines a common format for public transportation schedules. GTFS data allow public transit agencies to publish their transit data and developers to write applications that use the data in an interoperable way. GTFS data can change due to the fact that times for departure and arrival change, e.g. transport companies often use a different summer and winter schedules. Currently the transport companies have to create the PDF documents that are basis for the printed timetables in the bus stops manually: a change of the departure/arrival time leads to a change of the GTFS database leads to the fact that the schedule at the bus stop has to be exchanged. Public transport companies using and offering this mobile application no longer have to create timetables manually instead they are made automatically from the GTFS data. Moreover this has the advantage that bus stops (especially those in rural remote areas) can be equipped with QR-codes instead of printed time tables: Scanning these QR-codes (using a standard QR-code scanner from Google PlayStore or Apple iTunes) the user of public transport gets the valid data of the bus immediately on his smartphone. An exchange of printed timetables because of a schedule change is no longer necessary.

9. WHAT ARE THE HIGHLIGHTS OF THIS BEST PRACTICE APPLICATION?

The highlight of this application is that currently three applications are merged to one single app with a high range of functions. In the near future another application from Jade University that creates real time data of the busses position (using GPS trackers) can also be integrated in this combined application. Using this final application the user of public transport has the ability to always get valid and real time departure and arrival times of the busses he is interested in. The use of the GTFS format and the separate language file make it very easy to adopt this application to other regions.

10. INTEGRATION OF INTERESTED USERS/ORGANIZATIONS IN THE DEVELOPMENT PROCESS - DOES THE USERS/ORGANIZATIONS HAS BEEN PART OF THE DEVELOPMENT PROCESS?

In Germany the application was developed with the cooperation of the VEJ, which is the umbrella organization for all local bus companies. To test the application in urban regions the Stadtwerke Wilhelmshaven provided their schedules and participated in testing, for rural regions we cooperated with Edzard Reisen. The two bus companies also provided a bus each for testing the real time trackers. The VEJ also asked all bus companies for their permission to use their schedule data in GTFS format and by mid-August this GTFS data will be provided by Connect, which hosts all schedules for Lower Saxony to any interested party.

11. ORGANIZATIONAL REQUIREMENTS - HOW MUST A USER/ORGANIZATION BE STRUCTURED TO IMPLEMENT THIS BEST PRACTICE APPLICATION?

Providing valid GTFS data is mandatory for this application to provide the data for the virtual timetables. If there is more than one bus company involved there needs to be some standards (i.e. unique bus stop numbers) before the generation of valid GTFS data. If real time information

about the busses is needed, they must be equipped with GPS trackers and a GSM connection for uploading the bus positions to a central server. These trackers are inexpensive due to large amounts of devices built.

12. EFFORT FOR IMPLEMENTATION - HOW MUCH TIME AND MANPOWER IS REQUIRED TO IMPLEMENT THIS BEST PRACTICE APPLICATION? DO INTERESTED USERS/ORGANIZATIONS HAVE TO ARRANGE A (COMPLEX) PROCEDURE TO ADAPT THE APPLICATION TO THEIR NEEDS OR IS THIS BEST PRACTICE APPLICATION "READY TO START"?

For public transport companies: GTFS data and GPS tracker (if wanted) are required (see 11.).

For users: The application is ready to start after download and install process. A mobile device and sufficient network coverage are also needed.

13. SUCCESS FACTORS - WHAT FACTORS ARE REQUIRED TO HAVE A POSITIVE AFFECT ON THE OUTCOME OF THE IMPLEMENTATION (E.G. MOBILE BROADBAND COVERAGE, KNOWLEDGE AND SKILLS OF USERS, ATTITUDE OF USERS, SMARTPHONE AND INTERNET USAGE AMONG USERS, ETC.)?

For the user a network connected device is mandatory. A browser can access all other functions of the application, so no further software downloads are necessary. Basic skills in using a browser on the mobile device are required. As we saw within a user empowerment workshop these skills are not always present. Especially for the main target group of elderly people, this might be the case. But we also saw that these skills can be acquired within a relatively short time.

14. SYSTEM SUPPORT - WHAT TRANSACTIONS OR PROGRAMS ARE REQUIRED FOR THIS BEST PRACTICE APPLICATION TO WORK?

On the user side: none

On the side of the public transport companies a LAMP server to host the backend system is required. This system – as is the developed software – is Open Source and can be downloaded for free.

15. HOW WAS THE PRACTICAL USE OF THIS BEST PRACTICE APPLICATION TESTED - HOW WAS ITS FUNCTION CONFIRMED?

We did run an evaluation of the departure monitor within our university. About 150 students did hand in an evaluation form. Overall there was a good reception on the usefulness of the application. The student union even voted for a permanent installation of departure monitors in the main buildings of our university.

16. WHAT ARE THE CRUCIAL FACTORS THAT MAKE THIS BEST PRACTICE APPLICATION HIGHLY USABLE?

This application was developed under the usability-criteria of the ISO9241 Part 110 standard. In particular, the criteria suitability for the task, self-descriptiveness and controllability are implemented in an excellent way. The application can be used intuitively. A click on a bus stop symbol will give more information about the time table at this bus stop. The time table provides information about the next five departure times at this bus stop. There is no further information, so the statement is unambiguous and clear.

In printed versions of time tables normally encoded departure times on special days (weekends, holidays etc.) are included. In this application, this information is already enclosed into the indicated departure times. The user does not have to do any additional decoding or considerations. Thereby another usability-criterion, the minimization of user's memory load, is given.

An additional benefit is that this application can easily be adopted from all partner regions. Users like tourists (an important part of the target group) might know the application and are familiar with it. So consistency is given and a kind of standard has been developed.

The real time information is another advantage. Especially in rural regions the bus stop are further away from the living place of the users than in urban regions. Also delays are more likely because the distances between the bus stops are greater. The knowledge about the real arrival or departure time ensures transparency.

17. WHAT ARE THE CRUCIAL FACTORS FOR MAKING THIS BEST PRACTICE APPLICATION HIGHLY SUCCESSFUL FROM A PUBLIC RELATIONSHIP PERSPECTIVE?

The applications give the bus company a more modern image because state of the art technology is used to inform the customers. The customers can get there information about bus arrivals and additional information that is more valid than it would be with only a paper bus schedule. The bus company can inform immediately about special situations e.g. accidents which will enhance the satisfaction of the user with the bus company and therefore the usage of public transport.

18. WHAT ARE THE CRUCIAL FACTORS THAT MAKE THIS BEST PRACTICE APPLICATION INTERESTING FOR TOURISTIC ISSUES IN THE REGIONS?

For tourists it is much easier to use their smart phones to be informed about public transport possibilities in their vacation region. Therefore they will tend more to the usage of public transport. Also the image of the region as a modern region that uses modern technology might create new kind of tourists that are interested in this kind of service.



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Accessibility through new
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