



Improving Transport and
Accessibility through new
Communication Technologies

APPLICATIONS AND THEIR PILOTING (WP 5)

January 2015

Imprint

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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 platform¹.

January 2015

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

¹ <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 Projectplace².

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-loket ³of 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.

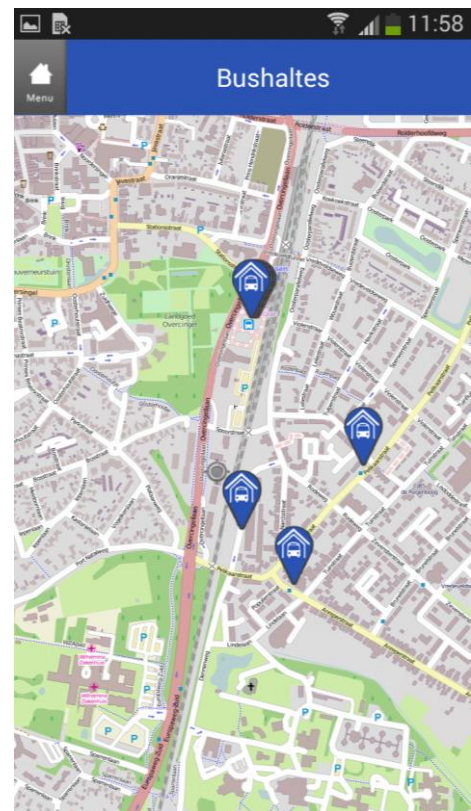


Image 3: Step By Step Mobile App

² https://service.projectplace.com/pp/pp.cgi/0/685406751?op=wget#/tab_docs
(WP5/Organization models for pilot development)

³ 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 Steunsteet’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.

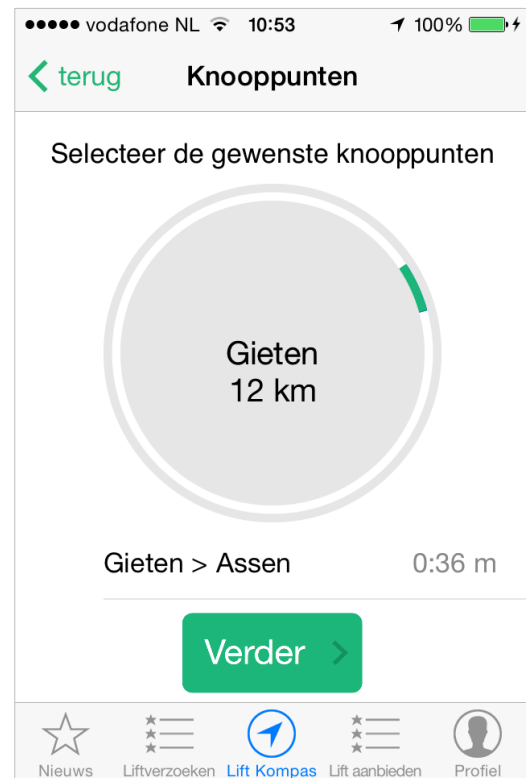


Image 4: Get Connected Mobile App

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 ‘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. 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 Steunstee’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.

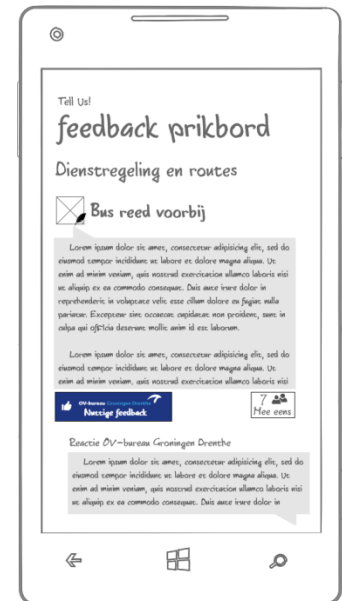


Image 5: Tell us! MockUp

OV-bureau already has a Digitaal Reizigerspanel⁴, 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.

⁴ <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.

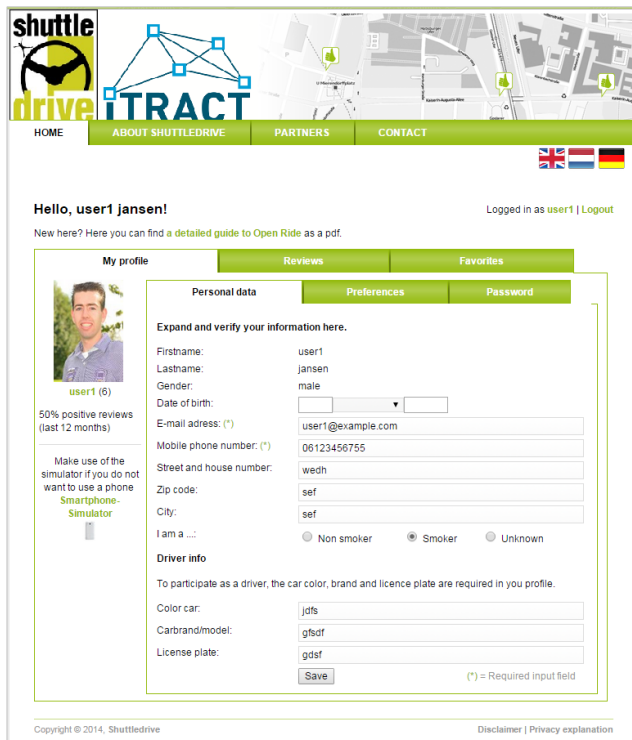


Image 6: Web Frontend

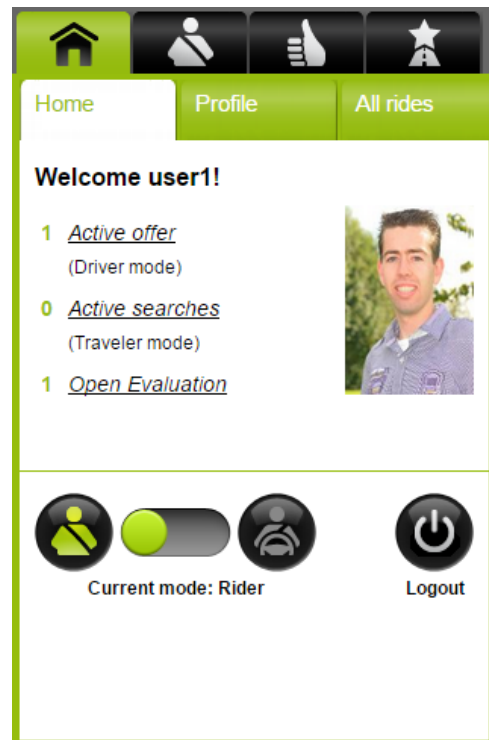


Image 7: Mobile Frontend

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)

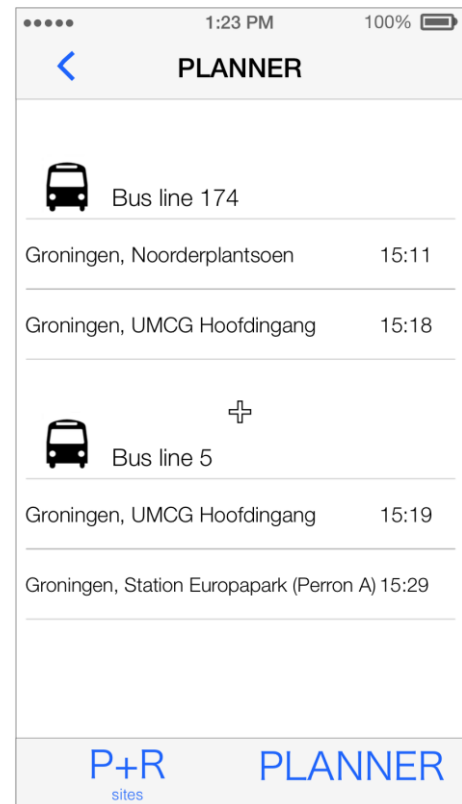


Image 8: P+R Mobile Planner

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

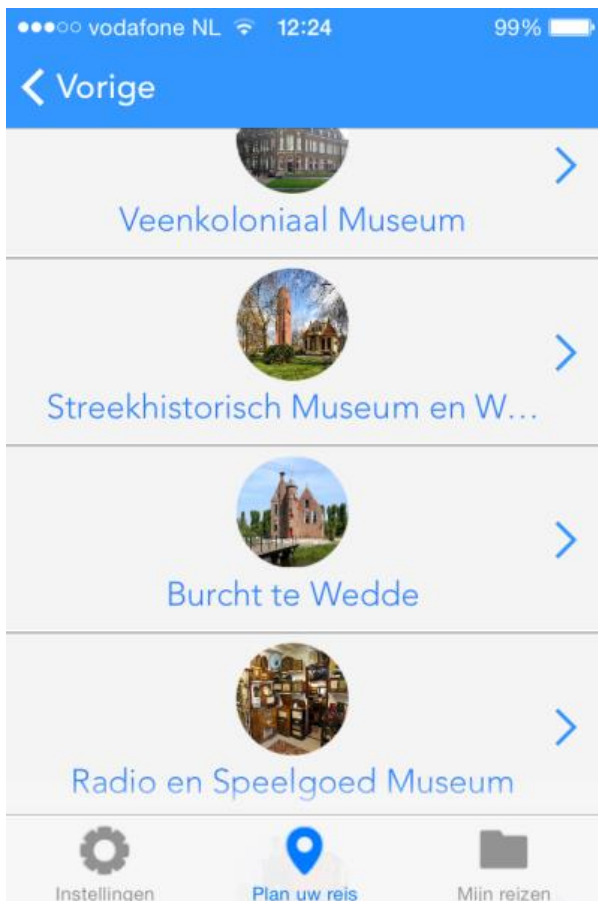


Image 10: Scan and Go POI Overview



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!

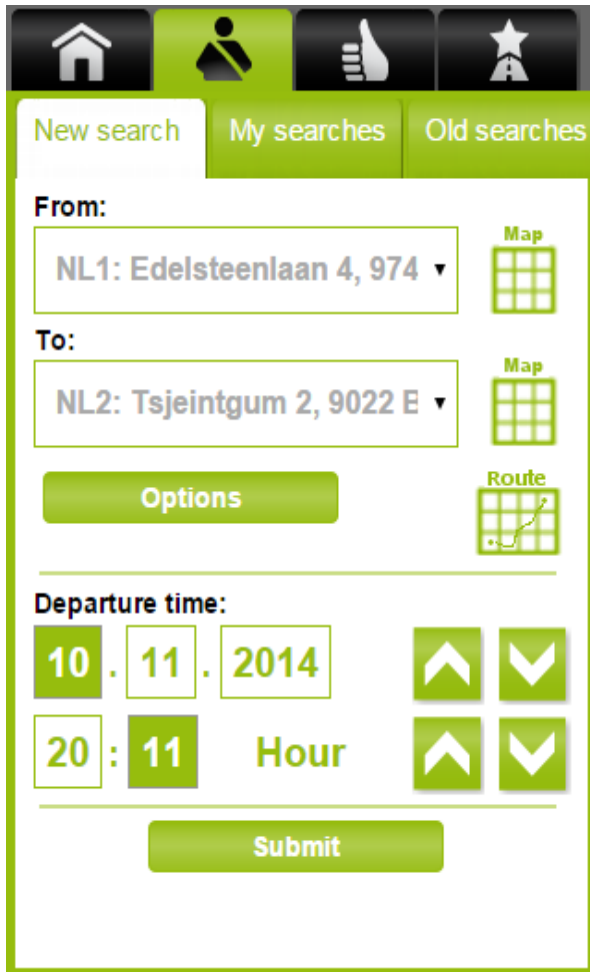


Image 12: Mobile Search

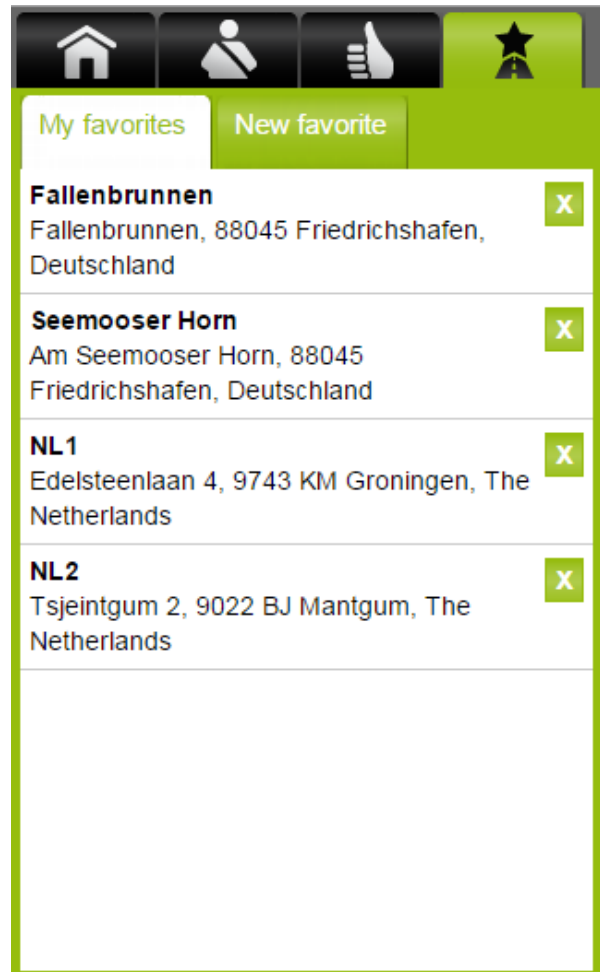


Image 11: Favorite Places

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.

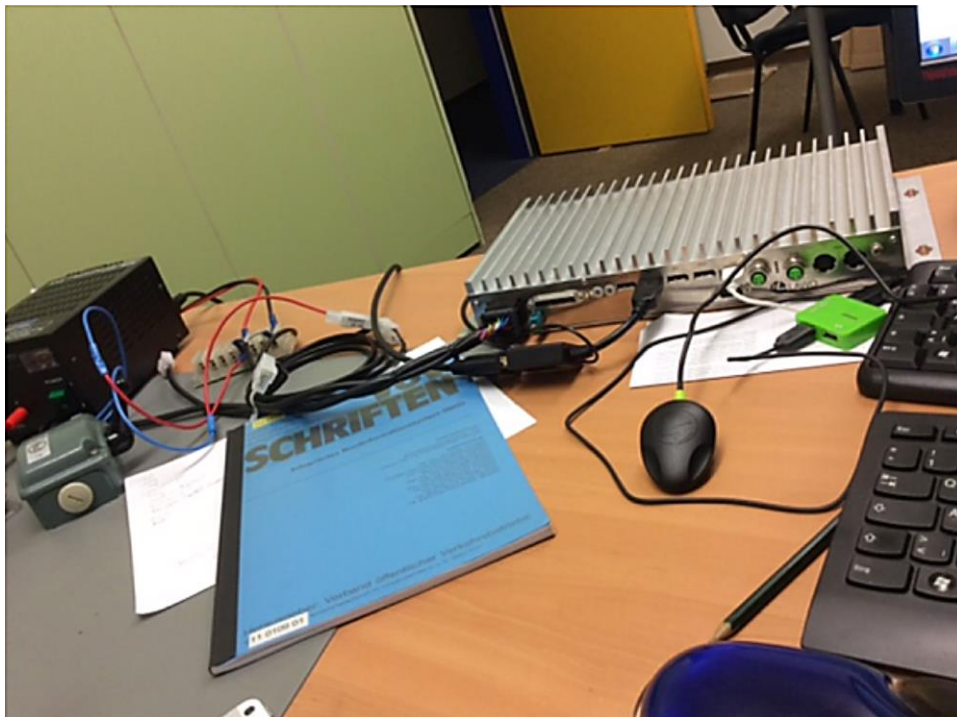


Image 13: GPS Device

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 barcode and the old card with the old barcode is locked. For that reason illegal use of the ticket can easily be pre-vented.

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.

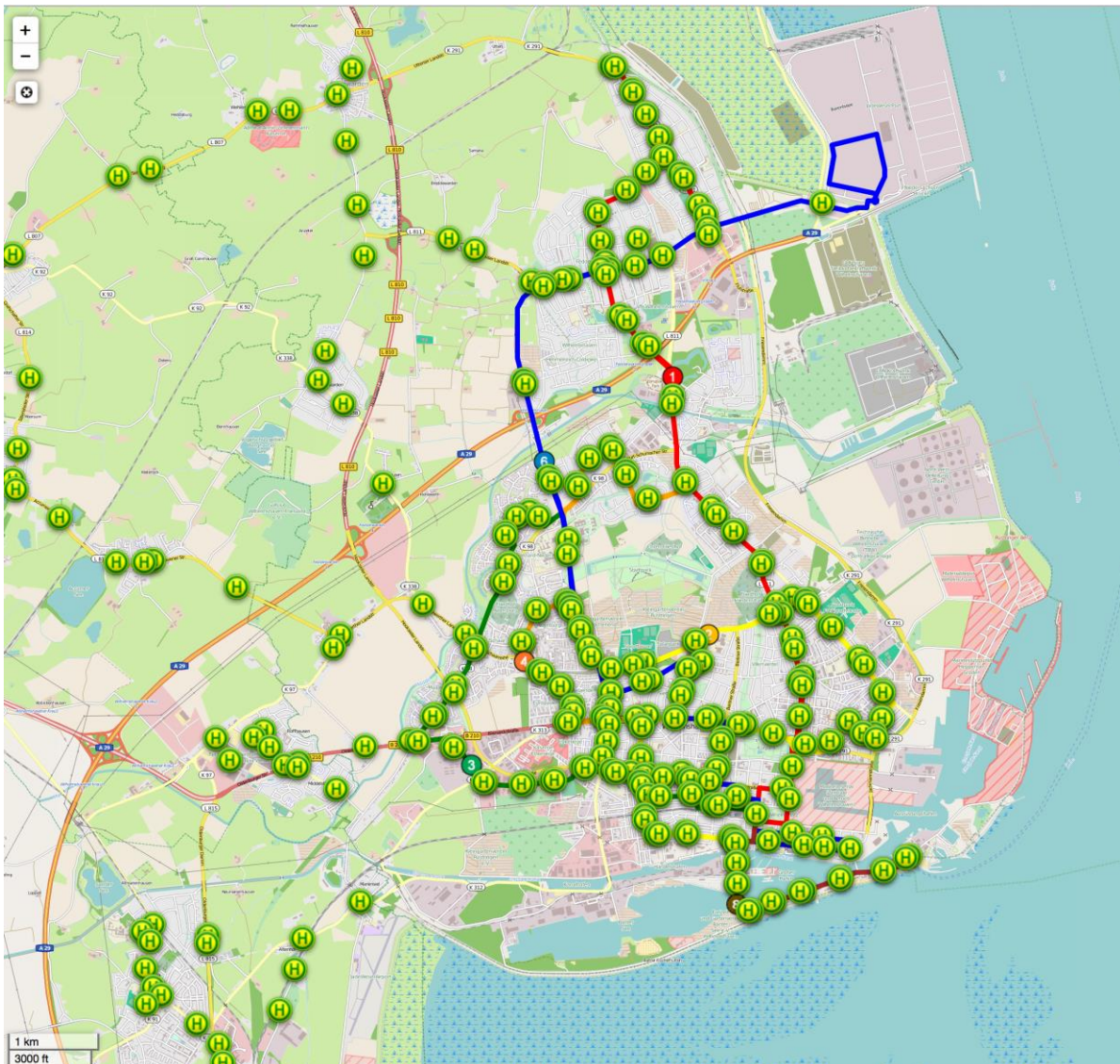


Image 15 : Webview of Wilhelmshaven Bus Stops

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.

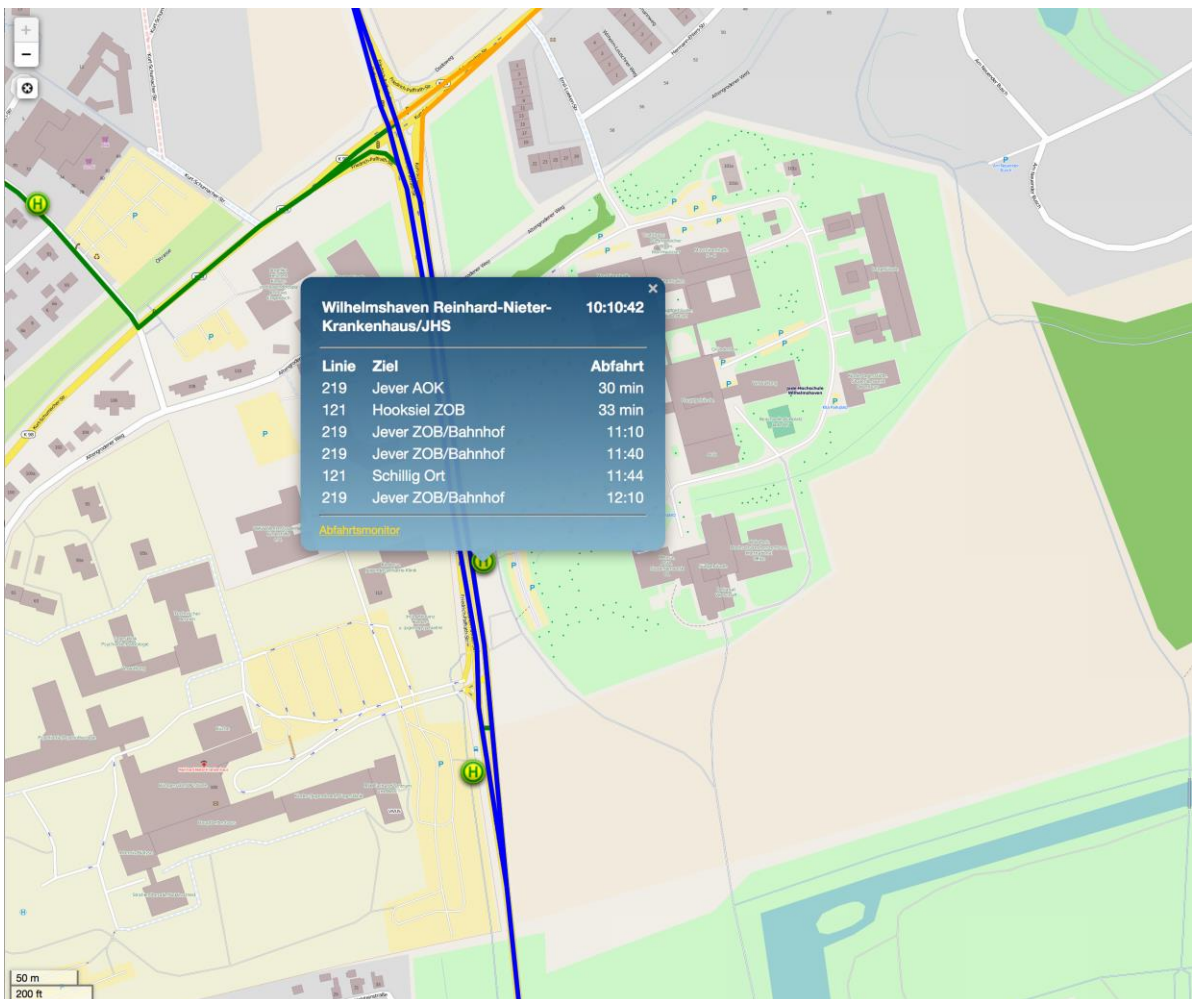


Image 16: Bus Plan at Jade Hochschule

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. Therefore 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.



Image 18: Example of a Visualized Question

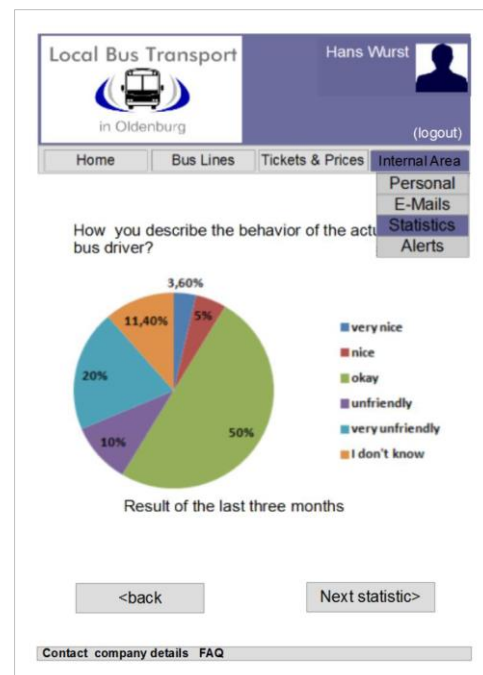


Image 19: Graphical Statistic Output

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.

Wilhelmshaven Reinhard-Nieter-Krankenhaus/JHS			6
Nach: Kaiser-Wilhelm-Brücke / ZOB			
	Montag - Freitag	Samstag	Sonntag / Feiertag
06	14, 34, 54,	35,	35 ₂
07	14, 34, 54,	03, 33,	
08	14, 34, 54,	03, 33,	
09	14, 34, 54,	03, 33,	02,
10	14, 34, 54,	03, 34, 54,	02,
11	14, 34, 54,	14, 34, 54,	02,
12	14, 34, 54,	14, 34, 54,	02,
13	14, 34, 54,	14, 34, 54,	03, 33,
14	14, 34, 54,	14, 34, 54,	03, 33,
15	14, 34, 54,	14, 34, 54,	03, 33,
16	14, 34 ₂ , 54,	14, 34,	03, 33,
17	14, 34, 54,	03, 33,	03, 33,
18	14, 34, 54,	03, 33,	03,
19	14, 36,	03, 33,	02,
20	13,	23,	02,
21	02,	02,	02,
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 web⁵.

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

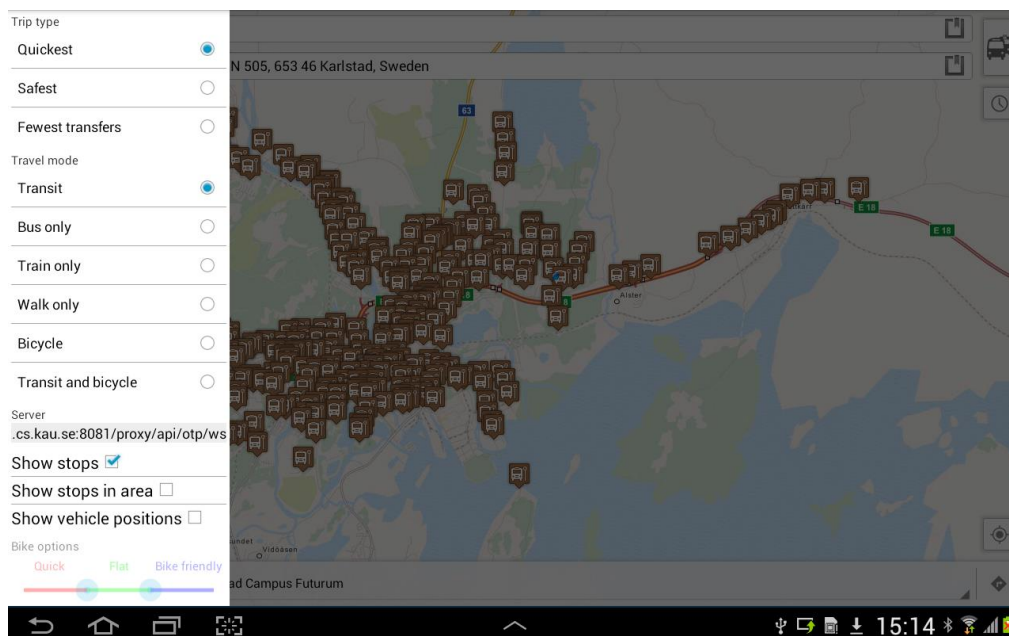


Image 25: Mobitime Realtime Overview

⁵ <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

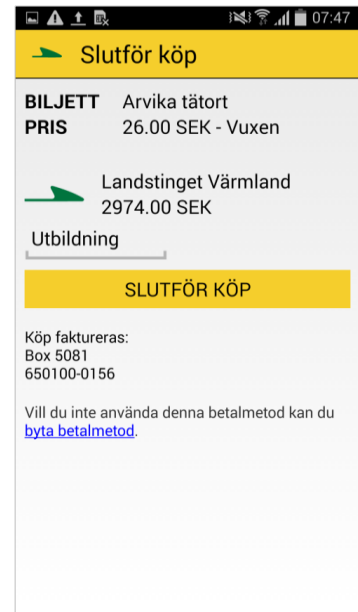


Image 27: Android App 1



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

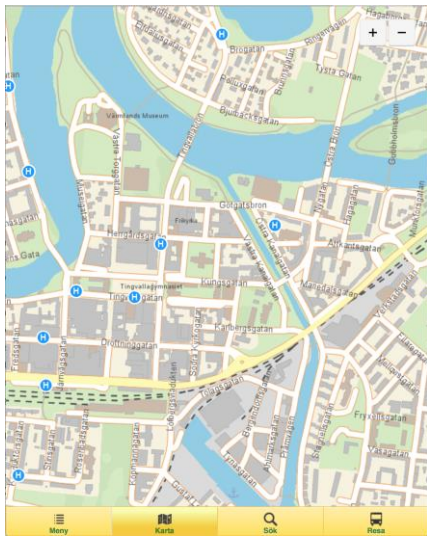


Image 29: Realtime Mobile App 1

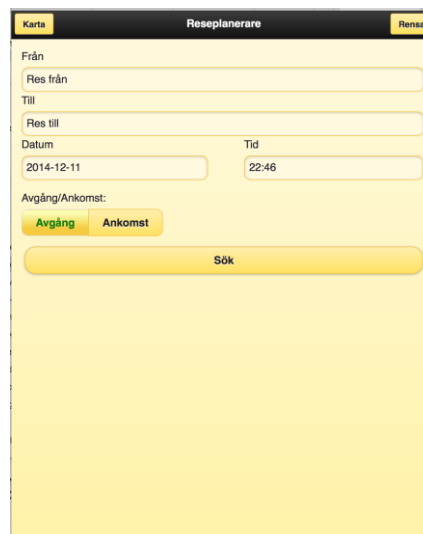


Image 30: Realtime Mobile App 2

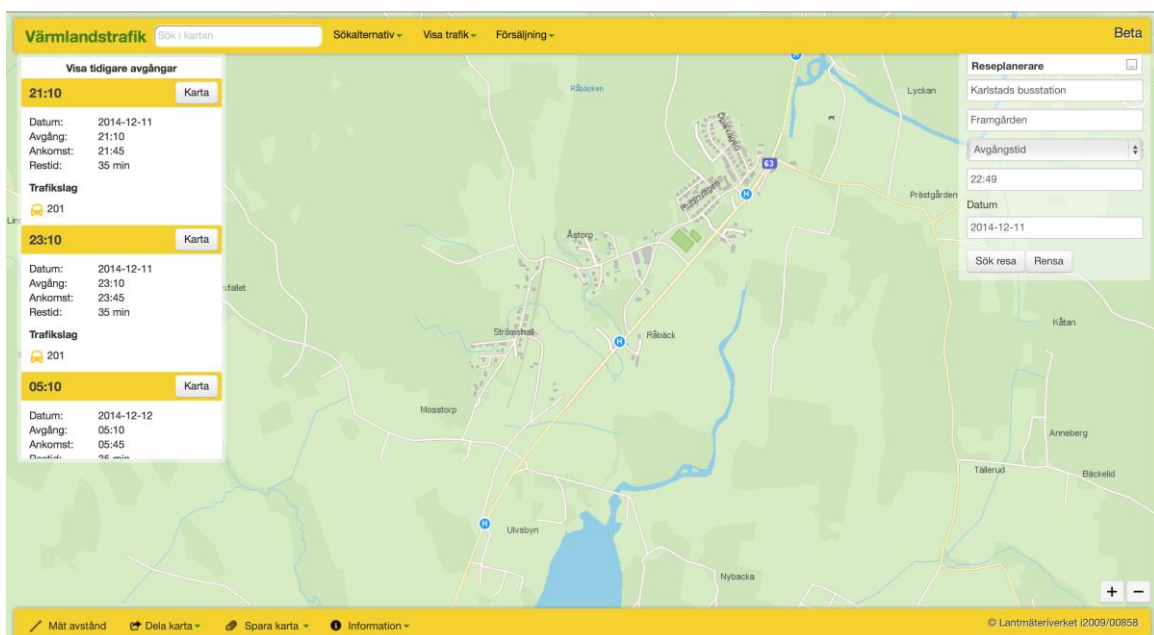


Image 31: Web Planner

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.

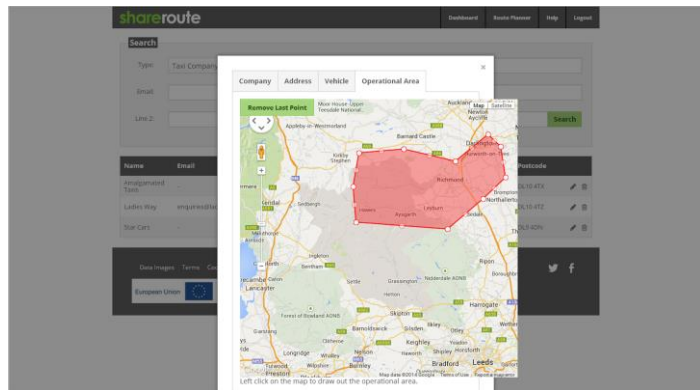


Image 32: Map Overview

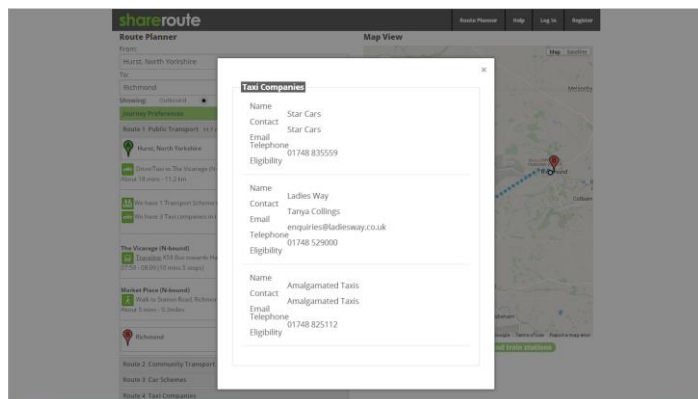


Image 33: Company Overview

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 Connect		
Service	Destination	Time
	Grassington National Park	11:02
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

here's more ways to Tour de Yorkshire. Why not take the bus? Ask inside for more information.

Connecting people and places in the dales

Image 35: Dashboard 1

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

ake the bus? Ask inside for more information.

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

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.

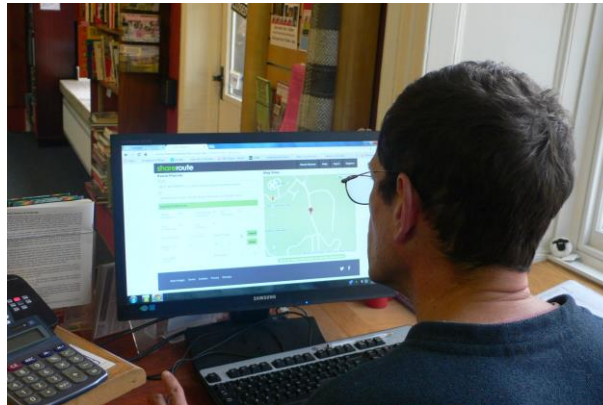


Image 36: Working with ShareRoute

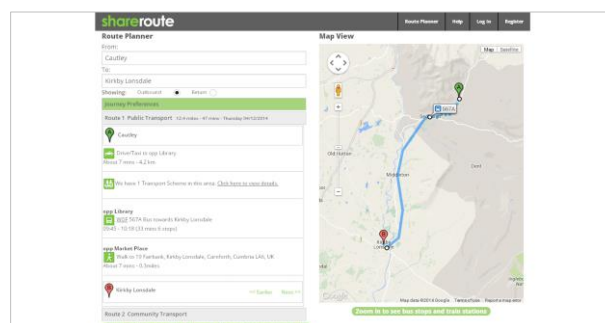


Image 37: Route Planner

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.

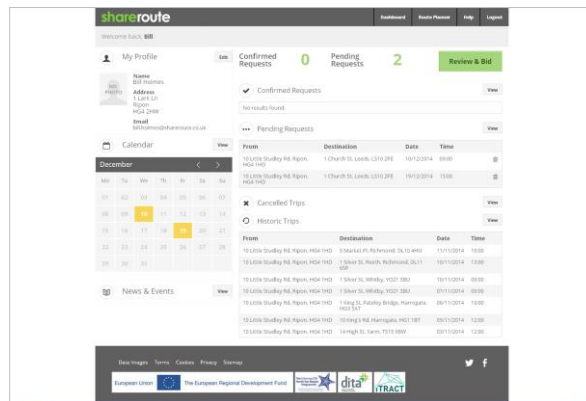


Image 38: Driver Details

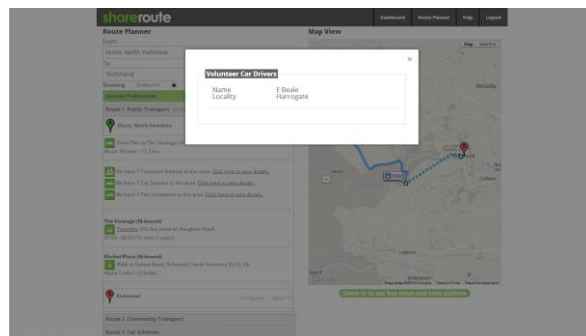


Image 39: Car Link

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.

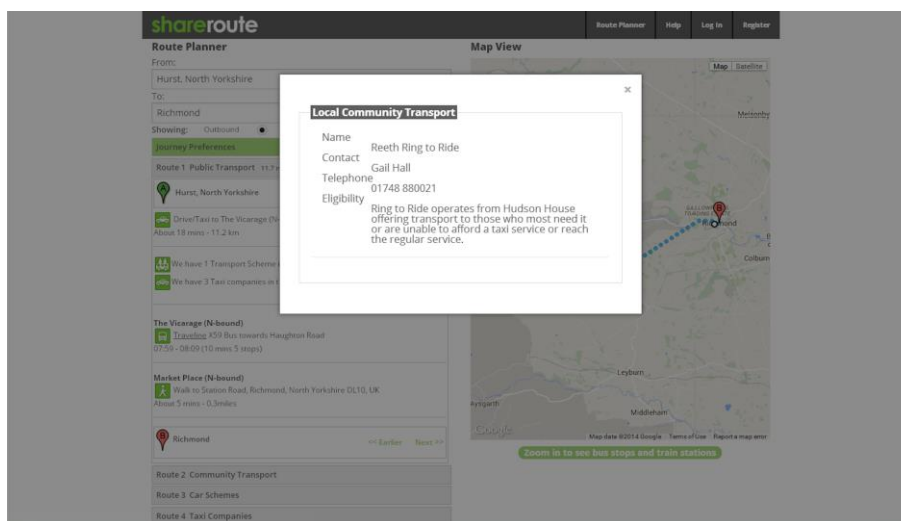


Image 40: Local Community Transport

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.

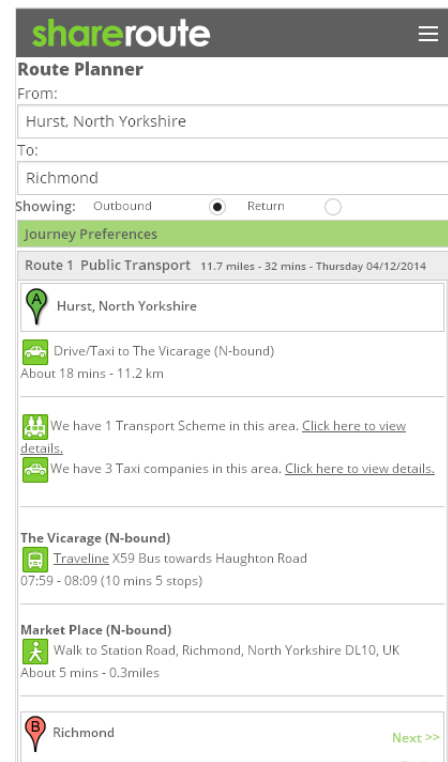


Image 42: ShareRoute Mobile App

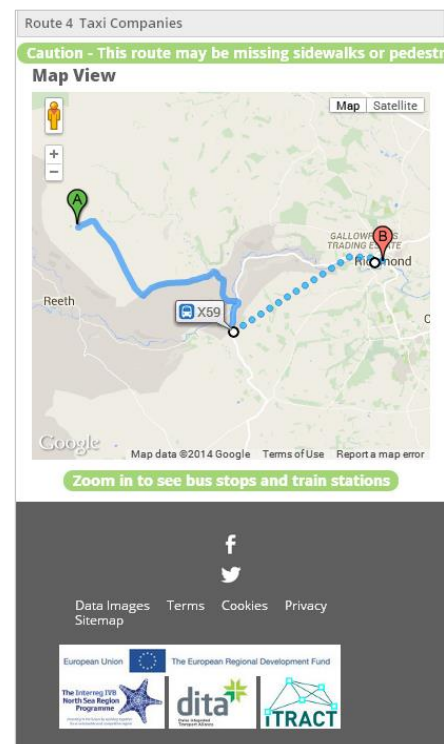


Image 43: Mobile Map View

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

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:

An Excel-based monitoring sheet has been created by Jade Univ. to monitor the current status of application development approx. every 2 months. The different regional coordinators were frequently requested to define their current work progress (in %) 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 ITRACT project visible for everyone. The 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 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.

