INFORMATION TRANSFER BOOSTS TRAVEL IN AUSTRIA

Integrating an intermodal travel information system with real-time information and combined tickets for parking and public transport was the starting point of TRANSFER*.
The project ran from 2007 to 2009 and was co-funded by the Austrian Federal Ministry. Geographic coverage was the province of Styria, with a focus on its capital Graz. The main aims were to integrate and improve existing services into a so-called 'Travel Information Service Provider' – in this case a single website providing users with the relevant details for their intermodal journey. This information should ensure freedom of choice and include a comparison of all mobility modes – walking, cycling, public transport and the car.

TRANSFER developed a system featuring the following key points:

- intermodal static transport information (including walking, cycling, public transport and motorised traffic modes)
- intermodal and dynamic real-time traffic information
- comparison of the different modes (mainly by including time for parking for motorised traffic) and, most importantly
- integration of services into one system

This integrated system – called the 'Traffic Information Service Provider' in the context of the project – was developed into a functional prototype. It is now being further tested and improved, with talks ongoing as to future use.

Consortium

The following partners[1] took part in TRANSFER:

- FGM Forschungsgesellschaft Mobilität – consortium leader
- Steirische Verkehrsverbund GmbH – traffic information service provider
- Grazer Stadtwerke AG – Verkehrsbetriebe – Graz public transport operator
- Grazer Parkraummanagement GmbH – in charge of Park & Ride site
- Mentz Datenverarbeitung Austria GmbH – providers of technical backbone for traffic information system
- Mobilkom Austria – responsible for mobile applications
- Stadt Graz, Straßenamt – management of real-time data for car traffic in Graz
- Technische Universität München – technical backbone for the real-time data for car traffic.

What we tried to solve

Mobility requires financial resources, space and above all environmental resources – in any case, commodities that are scarce. Mainly in transport, in politically problematic zones like city outskirts with high numbers of commuters, it is often impossible to provide adequate public transport within acceptable walking distances. And this is even more a problem in sparsely populated rural areas.

Intermodality, e.g. Park & Ride, Bike & Ride and Ride & Bike, is one solution to overcoming these problems and studies, such as 'Towards Passenger Intermodality in the EU'[2], confirm this.

Information – the key to intermodality

Several barriers are currently hindering intermodality: there is no umbrella system providing information on an intermodal trip for a mobility chain (car, parking, public transport and walking), nor details on fares or the possibility of booking a ticket for the whole trip.

And there is a serious lack of information if something goes wrong, either with a car trip (e.g. congestion or road closures) or in public transport (e.g. delays or changes in routing) or, even worse, about possible alternatives.

Single information or booking systems do exist to some extent, but a Travel Information Service Provider offering these services as a One-Stop-Shop, is sorely missing.

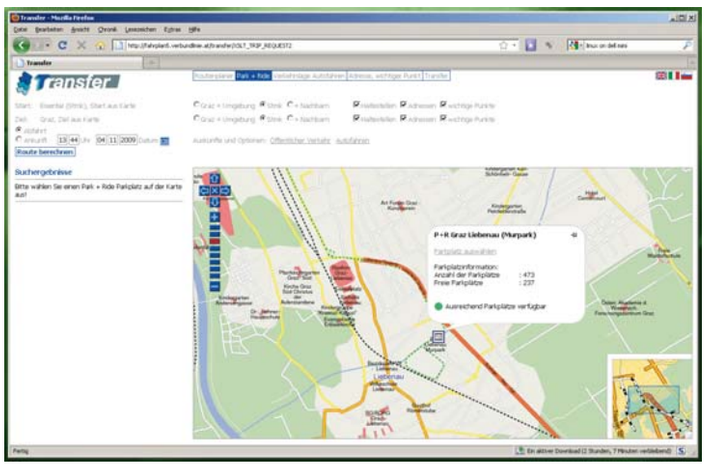
Building the system backbone

Static travel information is the backbone of the whole system. TRANSFER was in the lucky position to be able to build on the back of the existing system of the Styrian Public Transport Association[3]. This umbrella organisation of public transport operators is responsible for integrated ticketing, i.e. one ticket for all companies.

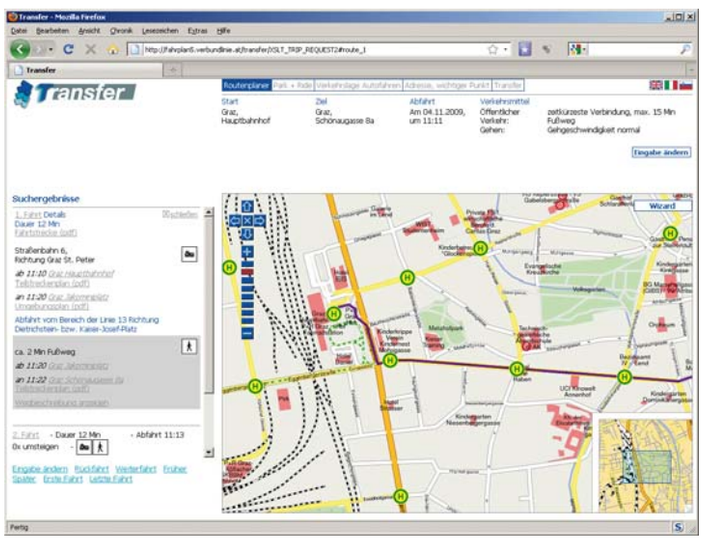
The current system is internet-based and provides information on the schedules of all public transport in Styria, plus details on walking. The user enters the start and destination addresses of the trip, and the system calculates the rest in detail, e.g. the walk to the next station, the public transport ride – plus interchange and interconnecting walks – and the walk from the last stop to the final destination. There is no need for the user to know where the next stop is situated.

The system is GIS-based and therefore able to provide maps (e.g. for the walking parts). The background geographic data was originally obtained from one of the large commercial providers (about ten years ago), but was later switched to an own-source because the data from this provider was rather expensive and, most importantly, incomplete: e.g. for about a quarter of the public transport stops (situated mainly in rural areas) street data was missing, as well as most of the special public transport information (e.g. tram tracks or bus loops) and most of the walking details (small shortcuts that save quite some time).

Today's geographic dataset is a mixture of information collected and provided by the province of Styria and the city of Graz, both comprehensive but lacking in routing ability. The whole dataset was refined and the special public transport and walking data requirements added.



Screenshots of the search pages



'Integriertes Wegenetz' – Integrated Path Network

This parallel project underway in Germany is working on reintegrating all the Styrian geographic graphs. In Styria, various different parties collect and maintain the geographical network data, often in parallel, and each has its own reasons and special focus. As we also experienced in TRANSFER, it is difficult to put the data and information back together again without losing its geographical reference

Multimodality – adding cycling and cars to the equation

In TRANSFER – to become truly multimodal – additional information on additional transport modes had to be added. Public transport and walking were already included in the system, but special routing information had to be incorporated for cycling. Here the focus was Graz, whose bicycle-friendly political climate has led to the opening up of most of the one-way streets to cyclists (i.e. so they can cycle in the opposite direction) and to a reasonably well developed system of bike paths. Information on both was collected and integrated into the system.

For the private car most of the information was already in the existing system, but since

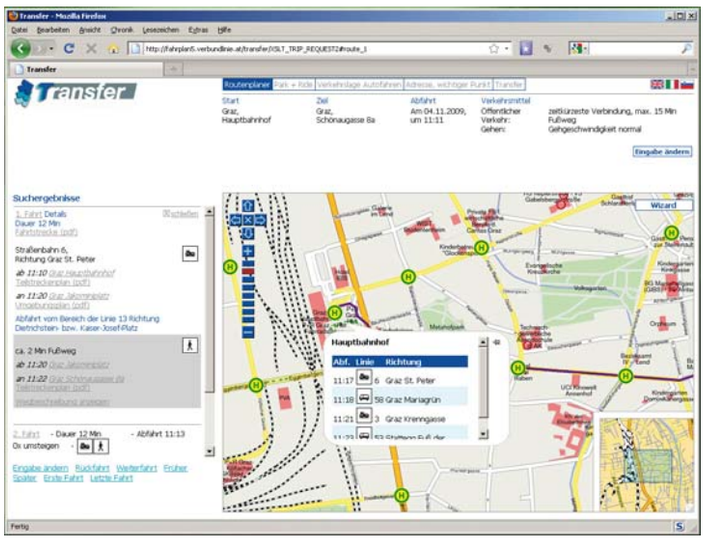
THIS INTEGRATED SYSTEM – CALLED THE 'TRAFFIC INFORMATION SERVICE PROVIDER' IN THE CONTEXT OF THE PROJECT – WAS DEVELOPED INTO A FUNCTIONAL PROTOTYPE. IT IS NOW BEING FURTHER TESTED AND IMPROVED, WITH TALKS ONGOING AS TO FUTURE USE

one of the aims of TRANSFER was to provide fair and comparable information, data on parking had to be incorporated. Again the focus was Graz, which has three different parking zones:

- 'blue' – mostly inner city where spaces are expensive and time limited
- 'green' – lower cost, longer stay, still city but not inner
- 'white' – parking is free

The Park & Ride parking spaces were entered for whole of Styria.

The information system is presented with a simple interface: users simply enter start and destination for their trip and choose the mode.



Screenshot of the search pages

Static information – schedules & the algorithm

Let's go back a few years to the pre-electronic era in Austria and Switzerland... and the 'Kursbuch' – an annual 'bible' containing information on all the public transport lines, a mass of dense footnotes and fluttering with post-it notes! There was even a saying in the sector – "the Kursbuch is out of date when it's fresh off the press". This leads to the issue of keeping scheduling up to date.

In Styria the system covers scheduling for the long term, e.g. for normal periods or summer holidays, and planned changes. For the latter the most obvious are construction works, which mean rerouting, or events where, for example, the tram is blocked and must be replaced by a bus. This information is known in advance and entered into the system in advance.

Nevertheless we discovered that it is rather difficult, or even dangerous, to give such data details to users: when seeking details on the system they tend to forget to set the exact date, i.e. if they want to travel from A to B tomorrow but search for the information today and don't enter the right date, then the schedule for today might not fit tomorrow and, even more risky, – if 'now' is some special schedule in place then the information may be wrong for any other occasion. We tried to solve this problem by providing the special schedule plus the reason why it is in place and for how long.

For calculating the time of the journey, the electronic system works on an optimise-by-time basis. For the computer this means the faster the trip the better; but is this always best? Sometimes the system calculates journeys to include long walks to distant stations and multiple interchanges, just to save two minutes for a three-hour trip. To resolve such problems efforts are being made in empirical research (currently underway in a follow-up project called 'Guaranteed Ride Home') to discover if the theories of transport specialists match those of passengers' theories, then improve the algorithms.

Going dynamic

To bring the multimodal information closer to reality we added dynamic real-time data. For public transport in Graz we are lucky to have a new integrated traffic control system in place (installed in 2003/2004). The real-time data on the location of all the buses and trams it provides is transferred from the control centre to the travel information system, using a standardised VDV454 interface. This delivers information such as 'Line XY scheduled for 4.45pm, 5 minutes late'. As a matter of fact this information is integrated into the whole trip

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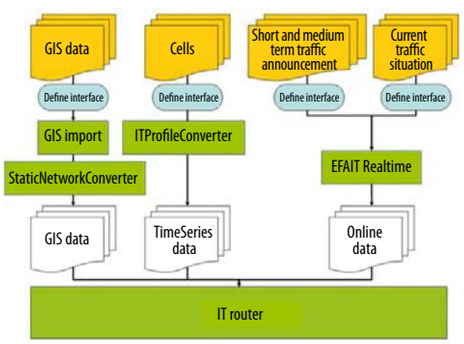
TO BRING THE MULTIMODAL INFORMATION CLOSER TO REALITY WE ADDED DYNAMIC REAL-TIME DATA. [THIS] IS TRANSFERRED FROM THE CONTROL CENTRE TO THE TRAVEL INFORMATION SYSTEM, USING A STANDARDISED VDV454 INTERFACE



chain, so if one part of the journey is delayed, rerouting can take place if necessary.

Real-time information for cars is also available. Graz has developed a so-called VLS system that gathers the real-time data as floating car data from a taxi fleet equipped with GPS, and using information provided from counting loops and detectors in the streets throughout the city. This system already exists but the data hasn't been published so far and was only available in the intranet of the magistrate of Graz.

Unfortunately there are several blind spots in the system, e.g. streets without counting loops and with too low taxi traffic to deliver in-depth information. So it is being enhanced with real-time data from buses operating on normal streets. This is used to calculate the trip information and overrides the speed information from the GIS data. Emphasis was laid on the fact that rerouting of private cars should also be based on transport policy principles, e.g. no rerouting from the higher road network into residential districts.

One crucial issue worth mentioning is that because the different systems relied on different data sources, quite some time and effort had to be spent on matching them. For example, the public transport company of Graz (which provides the real-time public transport information at system level) and the Styrian Transport Association (which provides the information system) both have separate sets of stops, which have to be matched. Also the GIS network, used by Graz for its real-time information is not the same as the one where this information will be finally presented.

Another problematic with dynamic information is data on interconnections. The system does contain static information that defines connections as guaranteed connections, i.e. traffic control tries to guarantee them (within limitations, of course). But for real-time information, there is no technology for transferring it from traffic control to the information system. However this hurdle is being tackled in another ongoing project.

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Parking – on thin ice

The integration of parking was a major issue during the project. The newly built park & ride in Graz was used as a test installation. It is served by a tram line to provide an excellent link to the city centre. All the necessary parking information (e.g. free spaces) is available, plus the departure of the next tram is displayed at the tram stop. The number of free spaces is integrated into the online information system.

Unfortunately this was where the data on parking ended and where the guesswork began. We had originally hoped to at least gain some data for the Park & Ride lot from some studies, but it proved too vague. So the system now only shows the location of the lots and how many places they have. Even worse was the data available for parking on the streets in the different parking zones in Graz. The original plan was to obtain data from the parking ticket vending machines, but even if it had been possible, the majority are residents' cars with season tickets issued elsewhere and not from these machines.

So in order to at least start with some information, there are standard values (time variation curves) for each zone indicating approximately how much time it will take to search for a parking lot. These values will hopefully be recalibrated in the future.

'Travel Information Service Provider' – integration

At the end of the project the 'Travel Information Service Provider' had been developed into a functional restricted prototype, with a state-of-the-art internet route planner. This means it is not only possible to plan your trip by entering origin and destination as addresses or points of interest, but also by selecting them on a clickable and dynamic rolling map. The trip is presented on dynamically generated maps.

The whole system is currently being transferred into normal operation with the focus on integrating it into the public transport information system of the Styrian Transport Association.

Outlook

Although the TRANSFER prototype itself is still under construction and not yet public, some details are available on the homepage of the Styrian Transport Association.

The systems have migrated from test to productive environments, and the path data in the background has switched to the integrated data from the integrated path network. General points such as optimising the trip calculation algorithms, or the whole subject area of interchanges, is being dealt with in the follow-up project 'Guaranteed Ride Home'. The overall vision is expansion to an Austrian-wide intermodal information system ●

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References

**Intermodales Reiseinformationssystem mit Echtzeitauskunft und kombinierten Park-Fahrkarten*

[1]FGM Forschungsgesellschaft Mobilität www.fgm.at; Steirische Verkehrsverbund Grazer Stadtwerke www.gvb.at; Grazer Parkraummanagement www.gpg.co.at; Mentz Datenverarbeitung Austria www.mentzdv.de; Mobilkom Austria www.mobilkomaustria.com; Stadt Graz, Straßenamt www.graz.at/cms/ziel/311315/DE; Technische Universität München www.vt.bv.tum.de; Steirische Verkehrsverbund Gesellschaft, www.verbundlinie.at;

[2]http://eu-portal.net/material/project_detail.phtml?sprache=en&kt=kt1c&name=Towards%20Passenger%20Intermodality%20in%20the%20EU;

[3]www.verbundlinie.at