

Franz Mühlethaler discusses solutions for overcoming information and acceptance obstacles to filling under-occupied cars

Reflecting rapidly increasing fuel prices, and growing recognition around the globe that mobility is a limited resource, Internet-based car pooling services have already sprung up in European countries including France, Germany, Italy, Switzerland and the UK. The logic is compelling; the more passengers per car, the better for the environment and peoples' pockets.

Such services can certainly be useful, but their scope is currently limited. Inspection of the top internet car pooling sites shows that these are mainly suitable for long-distance trips between large cities; and that the users are most frequently young people who can be highly flexible in terms of departure and/or arrival time, and often have limited financial resources.

Existing car pooling services are therefore inadequate when it comes to achieving any significant increase in average levels of car occupancy – and so decreasing the number of cars needed to deliver the same overall extent of mobility. The main reason is that the routes that most people travel in day-to-day traffic conditions as commuters or shoppers have very different characteristics from those used by today's typical carpooler. They typically lie in or close around large urban areas, are mainly used during rush hours, and have departure or arrival time fixed within a tolerance of a few minutes either way. So, can carpooling offer any benefits to this segment of the transport-using public?

In principle, I believe it can, given high rates of concurrence between origins, destinations and trip times. It is simply a matter of taking the right approach.

First, we have to introduce new technical features into carpooling systems. These are needed for the precise identification of locations, calculation of journey times and provision for a possible return trip within a separate car pool. It is important only to match routes that meet stipulated departure and arrival times. Drivers, of course, need to factor in detours to pick and drop off passengers.

It would obviously be asking too much of individual users to expect them to cope with all these details and find appropriate partners within a reasonable timescale. An effective system therefore has to be able to check automatically through all the available car pooling options and propose only those that precisely fit users' criteria.

At this point, car pooling enters the realm of ITS. One solution now available worldwide is

City logistics for Europe's drivers



Three commuters arrive for work – but need only one parking space

RideShare, developed under the leadership of PTV SWISS AG, the Swiss branch of European transportation planning consultancy the PTV Group. This aims to meet the necessary digital mapping, address location and identification, and routing requirements. Introduced as a way of tackling traffic congestion, the service also aims to contribute to combating climate change in accordance with the company's sustainability policy.

It therefore enjoys the support of the Swiss Climate Cent Foundation. This is a voluntary initiative by Swiss industry aimed at reducing CO₂ emissions and funded by a 1.5 Swiss cent levy on

all the country's petrol and diesel imports.

The service is currently Internet-based, with participants using their mobile phones as the most practical way of confirming arrangements and agreeing on where to meet. RideShare has decided that this is reasonable, not just on grounds of flexibility but also because, under Swiss law, all owners of mobile phones have to register and can be identified by their phone number if necessary.

This contributes an important element of security. RideShare provides each user with a unique code, for sending via a text message from the mobile phone with the registered number. In

the case of emergency, only, poolers can be identified. There are plans to extend access to the system over the next few years. This will enable participants to use their mobile phones or other devices record routes and access lists of car pools.

Critical mass

For car pooling to succeed, there naturally has to be a critical mass of users – or, to be more precise, of routes available for matching. Below this level, the probability that new users entering their route will find a convenient car pool is going to be relatively low, making participation a less attractive option. To achieve the desired virtuous circle, based on a loop of positive feedback, it is obviously important to ensure that the system can cope with demand. This is the role of the RideShare automatic matching function.

In most business sectors, competition between service providers helps to improve service quality. In car pooling, however, the contrary is true; splitting the market between a number of small independent services can mean that none of them is successful.

Cooperation is going to be the key to good performance, because it will enhance the probability of finding car pools. In the ideal case, there will be only a single large database for all users and routes, with a number of different user interfaces each designed to be suitable for a specific user community.

To allow for these variations, RideShare clearly separates the front and back ends of the system; the former containing the user interface and capable of being easily adapted; the latter, containing the database and matching functionality, being common to all services. Any provider can offer one and share the operating costs.

Again, the probability of finding car poolers increases dramatically if there is provision for picking up and dropping off passengers en route. Automatic matching can ensure that drivers and passengers don't need to share the same starting points and destinations.

One important requirement, however, is to draw sensible geographical boundaries, so as to ensure a satisfactorily high-user density of requested routes lying within reasonable proximity of each other. RideShare has therefore introduced the concept of the participating area. This consists of a cluster of municipalities, employer locations (and even event venues) that can promote an effective service and attract satisfactory numbers of users. Matching only routes that lie entirely within the participating area would be too restrictive, however; the key criterion is that either the origin or the destination do match.

A pilot trial of RideShare started in 2007 in the city of Thun, in the Swiss canton of Berne. While this has not yet achieved the necessary critical mass level, the service has enjoyed good local support and provided useful publicity and operating experience.

One participant was a local company that had run out of parking space for its employees, and decided to look at RideShare as a possible solu-



A carpooler books a trip

tion. The management, however, needed convincing as to the feasibility of the idea in order to free up a worthwhile number of parking bays.

The answer came through computer analysis of the home addresses and working hours of the 300 employees that regularly commuted by car. It turned out that, with car pooling, 70% could leave their vehicles at home, immediately solving the parking problem and – an environmental gain – also resulting in a 46% drop in the total daily distance driven each day. The company has decided to go ahead with RideShare and others have now shown interest in following suit.

Realistically, of course, we have had to contrast this positive outcome with a general reluctance of many people in the Thun region to use the service. There are very real behavioural obstacles to contend with when it comes to someone deciding to share their car with one or more others; or to refrain from using it and take a seat in someone else's. For car pooling to succeed to any significant extent, therefore, people need to take on board the concept that some, at least, of their driving needs to be in the public rather than in the private domain. What arguments can convince them?

First, of course, is the fact that, with fuel prices set to continue rising, car pooling will leave people with more spending money, even after sharing costs. RideShare includes provision for a pooled transport fee for the driver, based on distance travelled, but still working out at less than the cost of public transport fares for passengers.

Another incentive would be the provision of, and access to, high occupancy vehicle (HOV) lanes for car pooling vehicles; or guaranteed and pre-bookable parking spaces at destinations.

Finally, promotion of car pooling will be most effective in 'hot spot' contexts where the benefits are obvious. Examples include extensive road works on major arterial routes, out-of-town shopping centres, and sporting or leisure venues.

Car pooling and congestion charging

Other natural 'hot spot' candidates are areas that have implemented, or plan to implement, urban congestion charging. While there are currently no concrete plans to designate any such zones in Switzerland, cities such as London or Stockholm could certainly profit from the idea.

Assuming congestion charging is introduced in a city centre zone, as it has been in London and Stockholm, destinations of arriving cars will tend to be relatively close to each other. Even if they are a km or two apart, a short, low-cost metro hop will complete individual onward journeys. Starting points may be distributed over quite a wide commuter area; but the probability of finding at least partial car pools will be relatively high. Cars with the longest routes will pass the starting points of shorter ones and can pick up car poolers en-route.

Overall, congestion charging and carpooling will benefit each other. For the latter, charging offers an opportunity to achieve the necessary critical mass at less cost in promotional effort and expense. For the former, with its unavoidable acceptance problems, car pooling can be yet another option in the mix of alternative transport options. This last argument could well justify the introduction of a charging discount for car poolers. An additional accompanying measure to make car pooling more attractive could be the installation of designated parking areas for car pools at various places around the zone, where the car pool partners could meet, park one car and continue the route together. This concept, applied to the domain of goods transport, is already well known as city logistics.

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