



Dynamic journey matching

Concept overview

This document introduces the idea of 'dynamic journey matching' service. In contrast to traditional ridesharing (or carpooling) schemes, dynamic journey matching programmes seek to create *real time* matchmaking between passengers who need to get to a destination and people driving similar routes at similar times. Matches are made on a *trip by trip basis*.

The majority of people already carry the piece of technology needed to make dynamic journey matching successful – a mobile telephone. As mobile phone features such as GPS, mapping software and intuitive interfaces become standard in coming years, users will gain access to an unprecedented amount of services and information in real time. This will dramatically increase the feasibility of dynamic ridesharing, allowing commuters equipped with a mobile phone to communicate with a ridesharing service; indicate their location; describe and update their travel intentions; make payments automatically and provide feedback on other participants. Combining these capabilities with a well-designed management system; institutional support from local authorities; and appropriate marketing creates an opening for this technology to dramatically lift rates of ridesharing.

We see parallels to TradeMe; by using technology to lower hurdles associated with buying and selling second-hand goods (including social resistance to undertaking transactions online), TradeMe has transformed the marketplace for used goods in New Zealand. Dynamic ridesharing has the potential to do the same for personal transport, with considerable benefits to New Zealand's economy and environment.

Benefits of ridesharing

The benefits of ridesharing are well-known, well-documented and readily quantified. More ridesharing means less vehicle kilometres travelled (VKT) resulting in benefits for congestion, emissions (including greenhouse gases), energy efficiency, and averted costs of road construction.

Land Transport NZ estimates the costs of congestion in Auckland to be \$1.47 per km in 2008 NZD. The average passenger trip is 11.2km long, which suggests that the value of each additional peak hour passenger is approximately \$16.50 per trip.

This represents the direct savings to other road users in terms of congestion and vehicle operating cost savings – the benefits to the individual concerned are additional. At an individual level, carpoolers also benefit directly from the sharing of costs. For example, Rideshare – a scheme being run in Auckland – quotes \$1000/year for sharing with one other person. The economic benefits of increased ridesharing are self-evident.

Barriers to ridesharing

In New Zealand, and worldwide, vehicle occupancy is falling. Average vehicle occupancy in Auckland is at about 1.4, with peak hour occupancies as low as 1.1. There are clearly significant barriers to the widespread uptake of ridesharing, and existing approaches (such as High Occupancy Vehicle Lanes and work-based carpooling schemes) are not addressing all of them.

Increased uptake of ridesharing is likely to be thwarted by the following barriers:

- **Convenience:** Someone to share a ride with must be found, rides must be organised well in advance, and then a careful schedule must be kept to ensure that everything runs smoothly. Travel circumstances may also change such that even the most well coordinated ridesharing plans are occasionally disrupted.
- **Safety and security:** Ridesharing currently generally occurs within families, workplaces, and social networks in decreasing order of importance. Ridesharing therefore suffers in situations of low social connectivity and transparency, which is more typical of urban areas where ridesharing delivers the largest benefits.
- **Transaction costs:** When one person does less or no driving (perhaps because they don't own a car) payment must be arranged, along with all the complications this can entail.

Dynamic Journey Matching as a solution

A dynamic journey matching scheme offers the potential to overcome these barriers and dramatically increase the amount of ridesharing taking place. Firstly, convenience is an attribute missing from current approaches which mobile phone technology and advanced GPS systems may resolve. Secondly, safety and security can be enhanced through a system that knows who is being picked up and by which vehicles. Electronic checks may be installed which seek to ensure that carpoolers are "delivered" to their destination in an appropriate timeframe. In the event that they are not, follow up checks may be made. Finally, transaction costs may be reduced by allowing for the transfer of money between accounts electronically with no need to carry change.

Development priorities

The technical requirements for a dynamic journey matching scheme will need to be worked through but there other aspects that must be analysed and understood before an effective scheme could be developed. For example, what are the required levels of efficiency and ease of use that will lead to uptake of the scheme? What are the uptake levels required to gain critical mass and will additional incentives be required to reach them? What degree of confidence will users need with regard to trustworthiness (consider TradeMe's feedback system – would a similar approach work here?) Other issues such as the appropriate economic model along with questions of ownership (private/public) and feasibility will also need to be addressed. Scarlatti believes that proponents of traditional ridesharing schemes have typically underinvested in exploring these issues. The next step should be research to characterise the issues described above, followed by a pilot scheme to test the dynamic journey matching concept.

Contact

Scarlati would like to explore the concept of dynamic ridesharing with stakeholders in New Zealand's transport system.

Adam Barker

+64 9 550 8590

+64 21 220 9026

adam.barker@scarlati.co.nz

Geoff Leyland

+64 9 834 3359

+64 21 717 432

geoff_leyland@fastmail.fm