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With single-occupancy vehicles being a prime cause of congestion, **Jonathan Guard** details an advance in a real-time ridesharing technology that could bring a multi-modal, Shared Transport layer closer to reality

Images courtesy of Avego & University College Cork

Single-occupancy vehicles (SOVs) have been a contributing factor to many of the problems currently facing transportation planners. But advances in real-time ridesharing could transform SOVs into part of the solution.

SOVs don't have a good reputation among TDM professionals, and with good reason. Despite soaring fuel prices, increased traffic congestion, dwindling parking spaces, and higher carbon emissions, 76% of US drivers are still in SOVs. This over-reliance on private cars – in spite of the many compelling reasons not to drive alone – poses a unique challenge to transportation planners. Although high-occupancy vehicle (HOV) lanes have had some success, the sheer number of SOVs still on the road suggests they are in themselves not enough to effect a modal shift to ridesharing.

For many, the inconvenience of traditional ridesharing is the biggest barrier to a change in commuting behavior. Rideshares must be pre-arranged, and riders and drivers must stick to a rigid schedule for it to work. Any deviation from the routine – due to sickness or having to work late, for example – can throw a traditional rideshare into chaos. But now an emerging mode of travel called real-time ridesharing is poised to overcome these barriers, and promises to harness the unused seats in SOVs to offer a new, complementary layer between public and private modes of transportation.

Power to the people

What if you could rideshare whenever you wanted, from wherever you happened to be? A new technology from Avego called Shared Transport will allow you to do just that.

Using GPS-enabled smartphones, drivers and riders who want to rideshare along the same route are dynamically matched in real-time. Once a match is made, 'Shared Transport' manages the rideshare from pick-up to drop-off, as a result of a combination of automated security features, real-time passenger information, and electronic micro-payments that allow riders and drivers to easily share the cost of a journey.

Commuters expand the network by adding new stop locations at convenient places along their routes. As others join, a multi-modal,

How it works

Avego's free iPhone app allows riders and drivers to connect in real-time. Riders can also search and book rides from any web browser. The following shows how a Shared Transport real-time rideshare works.

First, a driver turns on the iPhone app and selects the route they're going to drive. Someone then searches for a ride along the same route, by using the iPhone app or their online user account.

The system automatically matches the driver with the rider, calculates the maximum fee to be charged to the rider, and offers the ride to both users. When both users have confirmed the ride, they are directed to a convenient pick-up location near the rider. The rider is also provided with reliable real-time passenger information (RTPI) – so they know exactly when the car is due to arrive.

When approaching the pick-up point, the driver receives an audio prompt informing him when to pull over. The driver then authenticates the rider by entering their auto-generated PIN into the iPhone app and drives the rider to their destination.

During the journey, the rider can sit back, relax and monitor the progress of the journey, accessing reliable real-time arrival information and a map view of their progress.

At the end of the journey, the system automatically charges the passenger a fair and predetermined price for the journey, based on a per-mile default rate, and manages the payment to the driver. Both users rate each other between one and five stars. If either user rates the other with one star, they will never be matched again.

> This over-reliance on private cars – in spite of the many compelling reasons not to drive alone – poses a unique challenge to transportation planners

A driver running the iPhone app is matched in real-time with anyone searching for a ride along the same route

interconnected network of fixed stops and user-generated stops grows over time. User-generated stops can be used to bridge the gaps between other modes of transport, offering a new option for people traveling to areas traditionally underserved by public transport, such as radial routes, business parks and rural areas.

Shared Transport is possible as a result of the ingenious integration of several technologies. With GPS, for instance, the software doesn't need to ask users where they are, or where they're going. Users can easily add stops to the system from wherever they happen to be.

The GSM mobile phone network keeps the application in constant contact with users, providing real-time passenger information throughout the experience. Avego's geographic information system (GIS) makes real-time decisions to intelligently match drivers with riders. In relation to APIs, the Shared Transport platform enables external developers to create applications to use the transport, content, geographical, microtransactional and matching features of the technology. This makes dedicated transport applications and integrations with existing, legacy applications possible.

Sharing a ride with someone you don't know poses its own set of risks. Shared Transport manages these risks through several built-in security features. For example, there is a self-policing rating mechanism, whereby drivers and riders rate each other at the end of a journey. Once a user is matched with another user, they are provided with their details, including their photo and user rating. Drivers must authenticate riders by entering their auto-generated PIN at the start of each journey. Users can choose to travel only with people they already know and trust, while an audio notification means drivers don't need to interact with the app while driving. Lastly, every user is registered with the system and journey progress is logged using GPS.

Daimler's car2gether pilot in Ulm, Germany, will pool drivers and passengers in a web-based scheme, with passengers charged 9.5¢ per mile

Real-world results

In a recent Shared Transport pilot program conducted at University College Cork, Ireland, 16 real-time ridesharers created 794 stops over a four-month period. The stops sprouted up throughout the Cork region, demonstrating how the service can add a complementary layer to existing modes of transport.

Pilot programs are a great way to build a 'critical mass' of Shared Transport users along heavily used transport corridors. Upcoming pilots are planned for Nottingham, UK, and Bergen, Norway, with several also in development in the USA.

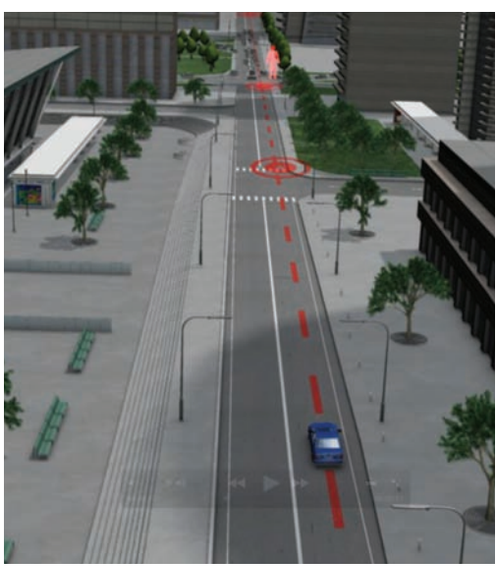
Moving forward

By using market forces to harness consumer self-interest, Shared Transport extends the public transport network to include private vehicles. SOVs have a financial incentive to offer their wasted excess capacity to the public. The result is greater options for commuters, and a reduction in pollution, congestion, and parking demand. For transport planners, these results can be realized with minimal capital expenditure and no additional infrastructure requirement.

Shared Transport also provides a rich stream of useful data to commuters and transport planners. Commuters can generate detailed trip reports, calculate vehicle kilometers traveled (VKTs) and CO_2 emissions, while transport planners can quickly see the commuting patterns around their city.

Planners can help make Shared Transport a viable transport option by helping to build critical mass through pilot programs. Incentives, in the form of improved access to bus lanes, priority parking, and discounts on public transport can also help get commuters to consider a multi-modal approach to their daily commute.

In time, SOVs – with their excess capacity no longer being wasted – may someday be part of the solution to the problems facing transportation planners.



Shared Transport enables private cars to become part of the public transport network by providing a marketplace for drivers to offer their empty seats to others in real-time