

Passengers as Packets?

Could the basic concepts as well as the technological advances of the Information Highway be adapted to meet many of our suburban area personal transportation needs?

Most of you who read this note will be at least occasional if not frequent users of the Internet. Many of you will have used the shared door-to-door shuttle services available at most major airports today; and an increasing number of you will have encountered GPS-based navigation systems with video display screens and computer-based routing in your personal or rental automobiles. All of you will have at least some understanding of how these technologies function.

So, let's think outside the box and try to envision a potentially very attractive way in which these technologies might be combined to meet the personal transportation needs of people of all ages in a wide variety of suburban and even metropolitan areas, at substantially reduced cost and with substantially increased personal convenience over the private automobile, while simultaneously helping solve the traffic problems in these regions.

Let's use as our starting point the very different model of how data is carried on the packet-based "Information Highway" provided by the Internet. The result will be an approach we might call "passengers as packets," with these packeted passengers being transferred from origin to destination by a service we might call "SuperTaxi.com" or even "SuperLimo.com."

Let's begin with the technology already used by SuperShuttle and the other shared door-to-door airport shuttle services already in operation at many major airports — that is, a fleet of customized minivans with comfortable seating for perhaps 4 to 8 passengers, with power sliding doors on both sides and power activated tailgate access to a luggage area in the rear. These

vehicles communicate to a central highly computerized dispatch and routing system through a wireless data system (as most airport shuttle vehicles already do today). Add in GPS positioning in each van, along with video map displays of the type long available to individual motorists in Japan and rapidly becoming widespread in the United States; and combine these with highly sophisticated routing capabilities in the central computer for dispatching and dynamic rerouting of these vehicles.

Then envision a swarm of such vehicles traveling continuously through extended suburban and metropolitan areas in what may seem almost random patterns, making pickups and drop offs at multiple interlaced locations, thereby delivering on-call, computer-managed, dynamically rerouted, door-to-door or point-to-point, shared transportation for passengers and their belongings throughout all hours of the day and night:

Imagine a large fraction of this fleet busy early each morning ferrying employees from homes to workplaces or to local rapid transit stations, and at the other end from transit stations to workplaces, while also ferrying children to school or to daycare.

Imagine these same vehicles a little later in the morning ferrying senior citizens to shopping, medical appointments, or recreation centers --- including allowing them bring groceries or other purchases back to their homes on the return trips, assisted by the power-operated tailgate doors.

Imagine them in the early afternoon hours bringing children home from school, then taking them to music lessons, soccer games, or even just to friends' houses. And then a little later on --- presumably with a fresh cadre of drivers --- there will be the evening rush from workplaces back to rapid transit stations and homes; and still later in the evening transportation to evening meetings, night school classes, and entertainment events.

Individual trips in this system can be booked in advance on the web, or on an on-call basis by cellphone or at kiosks located at major pickup points

such as rapid transit stations and shopping malls, and perhaps even on a “flag-down” basis on the street, with the central computer at all times continually reassessing passenger origins and destinations and individual van rerouting.

Many regular daily trips will, of course, be pre-booked on a standing subscription basis, either by individuals or perhaps purchased in bulk by employers for their employees. Records of who's been carried where on standing accounts will flow wirelessly from vehicle to central computer. Payment for individual trips will be made on the web or by credit card in the vehicle using wireless card-swipe units (“driver carries no cash”). Retirement communities, shopping malls, medical centers, perhaps even individual stores and restaurants may take out prepaid bulk subscriptions to provide to their residents or offer to their clientele. The driver — or better, the central computer — can alert individual customers a few minutes in advance of pickups at residences or offices, minimizing delays and need for parking at these locations. Rates can depend on priority of service needed.

Though the title of this note speaks of “passengers as packets,” in information-highway terms it's of course the vehicles that are the packets and the passengers the data in those packets. The task of the routing algorithms will be to get those passengers where they want go as quickly as possible, accomplishing this on a shared basis for reasons of economy, efficiency, and widespread and immediate availability, but at the same time providing rapid, convenient, comfortable, and safe and personalized door-to-door service.

Imagine the same system providing parcel delivery services in off hours. Imagine extending the vehicle communications capabilities a bit so that passengers can have personal Wi-Fi access or satellite radio service en route if they wish. Imagine legislation that grants meaningful traffic priorities to these vehicles. Imagine not having to drive your children everywhere.

Imagine suburban families who could, with the aid of such a system, eliminate one of their cars; or metropolitan area couples who might retain no

car at all (as an increasing number of urban residents now do), relying on rental services or a few group-owned vehicles in a neighborhood or apartment house when they really need a private car. Imagine being able to sharply reduce the size of university and business parking lots. Imagine not worrying about whether your teenager will get home safely from a late-night party or school event.

There are many aspects of such a system that could be discussed at much greater length, and a number of potential problems for which solutions would need to be discovered. But this type of approach is my own view of what a realistic suburban and even urban transit system for the United States should and maybe eventually will look like. Such a system could become, in the words someone else has used to describe the Washington Metro, “a middle-class transportation system” — one that could be sufficiently comfortable, safe, convenient and yet inexpensive enough to get a large fraction of current motorists out of their cars. The requirements of such a system for initial capitalization and facilities seem sufficiently modest compared to large mass transit projects that “we really might be able to get there from here.”

--AES (1 June 2005; revised 9 June 2005)