



By: **Gordon Feller**

New Mobility Solutions Could Soon Be Swarming Inside Cities



“There are roughly 22 million trips made in Istanbul every day and in the past ten years, we have seen bus use decrease by 10%. Average travel times in the city, which were 40 minutes ten years ago, are now 50 minutes. Yet the mayor thinks that new roads, new junctions, and new bridges are the solution, it is terrible” explains city planner Orhan Demir at Plan Ofis Ltd.

Getting people, products, and information around cities in a sustainable and efficient manner, should be easy. In theory, if a city were designed around a renewable energy source, like a solar power plant, laid out with a network of transport systems that could tap this renewable energy, and then peopled with workers who mostly conducted work from their homes, the issue of keeping urban mobility green would be a minor one.

Unfortunately, as Istanbul all too clearly shows, most of the world does not have the luxury of starting from scratch.

Just as it is easy to build new buildings with the very best of safety and warning systems designed into them and extremely challenging to retrofit old structures, so too it is easy to build a new city with sustainable urban mobility factored in and a grim battle to make this work in communities that already exist.

Daunting as the task might be, with more than half the world's population living in urban environments, ideas ranging from those associated with vehicle design to those dealing with urban planning and changes in behaviour are emerging that look set to help cities improve the movement of their resources, both human and otherwise.

CityCars

One area of city design that is getting an understandably large amount of attention is transport technology that can be charged off of renewable electricity. A cunning system being proposed, called CityCar, uses miniature vehicles that run off of rechargeable batteries and weigh less than a thousand pounds each

to zip people around.

Designed with space as a key consideration, CityCars do not have side doors as modern cars do. Instead, during loading and unloading, the seats rise up as the car compacts itself and the front windshield opens as a door.

Part of the plan with CityCars is to have them function as shared vehicles that are communally used and stored in designated recharging zones

This, along with wheels that can turn perpendicular to the curb and drive sideways, allows the vehicles to park in much less space than that typically required by a Smart Car. Indeed, part of the plan with CityCars is to have them function as shared vehicles that are communally used and stored in designated recharging zones where they can be packed tightly together.

Of course, there is much that CityCar does not help when it comes to urban mobility. For one thing, it does little to improve safety and reduce traffic. Yet wireless communication technology is emerging that looks set to help.

IntelliDrive

The technology, which is being called IntelliDrive, blends technology similar to Wi-Fi with GPS information to allow vehicles to communicate. The US Department of Transportation, dozens of US state transport departments, and numerous private companies including Ford, General Motors, Toyota, and BMW are working together to give vehicles the ability to send signals to one another and to the systems that manage roads.

From a health and safety perspective, such a system is a godsend. Because cars on a road are aware of where they are in relation to other cars, drivers, who cannot see a car in a blind spot, can be warned by their vehicle as

they start to change lanes that they are about to cause a collision.

Equally important, emergency vehicles would have the ability to send out signals to both traffic lights and nearby vehicles that they are coming long before lights and sirens would otherwise be noticed. With such information, lights could change to give emergency vehicles favourable passage and drivers could pull over to let the vehicle through.

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Impressive as these possibilities are, the greatest gain is likely going to be in making roads more efficient transport networks.

If a road becomes congested, cars will communicate their deceleration to other nearby cars and these cars will relay the message. Eventually cars moving in the direction of the building congestion will be notified and can find alternative routes.

Traffic management systems, like lights that control traffic flow, can also make use of this information and intelligently adjust their behaviour to help improve road travel efficiency. Will this reduce stopping/starting and improve fuel/energy use on the road?

ULTra pods

Along a similar vein, mobile phone networks are moving towards making possible for people to know what shared vehicles are available near them and what nearby street conditions are like. "Vehicle sharing is showing a lot of promise, but a place where it falls down is having people know where cars actually are" says Guy Summers, head of Innovation at Vodafone.

Mobile phones with access to the internet and

GPS can effectively identify transport opportunities in real time, he explains.

Useful as CityCar technology and wireless networks are likely to be, it is possible that roads may not feature much in the urban transport systems of the future at all.

Indeed, some rail based systems, like Urban Light Transport, or ULTra for short, which runs small, pod-like, computer driven, electric vehicles along trackways that are elevated above the ground look particularly promising.

Unlike modern trams and metros that have fixed schedules, predetermined routes, and large regional stations, ULTra is decentralised and functions on demand.

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Most importantly, the pods communicate with one another and adjust their planned routes and speeds to prevent congestion.

A trial version of ULTra is currently running for staff at Heathrow Airport between a parking zone and terminal 5, but the plan is to ultimately connect parking areas, terminal buildings, hotels, and transport connections to the Underground, train, and bus networks.

With thousands of surface vehicle movements being used daily at Heathrow, ULTra is expected to both reduce emissions and speed up human transport. Even so, airport use is just the beginning.

“We see ourselves as fixing the last mile problem in cities” explains Martin Lowson, president of ULTra. Getting to and from public transport stations is one of the key reasons why many people do not use these forms of transport, because the last mile has no easy public transport.

“ULTra removes this problem by picking you up at your home and dropping you off at your final destination, eliminating the need for a car on a road” says Lowson.

The dumb road is going to become a thing of the past. The reasons for arguing this point are not based upon seeing ULTra in action, they are based upon seeing just how unsustainable city roads actually are.

Mayors are focused on the real-world

Mayors are very focused on the real-world and benefit greatly from seeing resource use in their cities in real time. With this purpose in mind, smart tech developers created a web technology that uses sensors placed throughout a city to show exactly how the city is functioning.

The technology monitors energy use in buildings, carbon emissions, people on public transport, people in cars, and much more.

The live data streaming makes it possible to identify just how much energy is wasted on congested roads or see which buildings are wasting the most electricity.

It is both a powerful tool that lets politicians see what actual effects their policies are having and a system that ultimately makes them more accountable for their actions. The system was trialled citywide in San Francisco and Amsterdam, and locally in a group of skyscrapers in Charlotte, North Carolina.

People need to learn that transporting electrons is not much different from transporting cargo.

The ideal situation, however, is to not have to transport anybody at all, and that is the idea behind improved virtual communications.



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“The real world and the virtual world are growing ever closer together” says Summers. People already can point their phones at buildings in the real world and, because the phones have GPS systems in them, the devices can work out what they are being pointed at and inform their user, he explains.

Virtual interaction is also increasing with use of programmes like Second Life. As users become ever more comfortable with using virtual visitation programmes, physical movement is likely going to be diminished. “We are quickly moving to a point where people are going to be able to converse and negotiate very comfortably in the virtual world and not need to use transport in the real world” says Summers.

And the social changes associated with human comfort around new technology go far beyond virtual visitation. If a person in one office can look at energy consumption in another office one floor above and see a serious difference, that could drive them to take action. The idea is to create a social identity associated with eco-friendliness.

At the moment, people do not talk much about being efficient drivers on the road. Indeed, it is rare for drivers to even consider the ecological effects of how often they put on the brakes. Accelerometers on phones could change this and give people the opportunity to brag about

what efficient drivers they are. “If people started sharing their carbon footprints on social media, this could create an incentive to change behaviour” says Summers.

Regardless of what mix of physical, virtual and social strategies cities adopt to combat the ever-increasing problems posed by urban mobility, the results should be transport networks that leave the landscape less polluted and get people where they want to go more quickly.