**Time, mobility and economic growth**

The roles of mobility and virtual mobility in the economy:

Economic growth is closely linked with the distances we are able to travel. The further people are, on average, able to travel, the greater the economic activity and the wealth of the society. The increasing use of information and communication technologies (ICT) is changing the nature of this linkage. With "virtual mobility" the importance of distance is less - but the connection with mobility remains. Two factors connect virtual mobility with previous developments in transport: the capacity to undertake activities in more distant locations having time freed up to carry out a greater range of activities.

The diagram below - without any great claims to precision - illustrates the relative contribution of various modes of mobility to economic growth in the modern era.

Before the industrial era, person power (walking, running, using slaves and servants), animal power (horses, donkeys, camels, etc) and wind power (for sails) provided the energy for mobility over shorter and longer distances. The distances we could travel, and our economic horizons, were severely limited. The unleashing of energy from fossil fuels powered a massive expansion of transport technologies and infrastructure to enable personal travel and freight transport on a global scale. Access to new markets stimulated both production and consumer demand.

The growth of a new mode of transportation does not necessarily bring about a decline in others. Initially, at least, the development of a new mode can stimulate another - e.g. the dawn of the canal age for a while boosted the (horse-drawn) haulage industry around inland ports. Despite this boost, there was a decline in relative importance to the economy.

Similarly, the 19th and early 20th century growth of telecommunications is closely associated with the growth of railways and international shipping. Running railways was made more efficient by use of the telegraph. In fact, in the first instance one network was laid out on the routes of the other. But telecommunication also became a medium of doing business in its own right, as well as supporting/enhancing traditional modes of transport. Telecommunications have moved on. We are now, we are frequently told, at the dawn of a new era - the "information age". The convergence of telecommunications and information technology are creating a new "mode" that can supplement and replace existing transport modes without the need to travel. The relationship between virtual mobility and older forms of physical mobility are complex. The effects of ICT can be to complement physical transport, or to replace it. Increasingly ICT are becoming pivotal for economic growth. By enabling "virtual mobility", ICT provide the means to undertake many of the activities that have so far needed physical transport. But more than this, virtual mobility also opens up new horizons and new potential for economic activity.

**Time, speed and distance**

Being able to "travel longer distances" does not necessarily mean travelling to far-off places. It also means being able to make many more journeys over shorter distances. Increases of speed mean that more journeys can be made in less time. So, for example, more customers can be served in the local area, as well as serving new customers in far-flung areas. Most importantly, increases in speed liberate time for other activities. These can be activities requiring travel, or not. Using the liberated time for value-creating activity - producing and consuming - fuels economic growth.

In economic terms, transport is, for the most part, a derived demand. That is, people want to do something, and travelling (or transporting goods) is a means to an end. I want to go to the cinema, or go shopping. I want a friend to have a gift. The need to travel or to transport something is derived from these needs or desires. Transport systems act as both an enabler for our desired activities, and a constraint. Often we can't do what we want, because the transport system doesn't allow it, or will only let us if we have large resources of time and/or money. The history of transport, from this standpoint, is the history of the loosening of these constraints. Making advances in transport technologies has hitherto been closely related to increases in energy consumption. Advances have also been associated with more effective use of our ration of time. Getting to places faster is desirable in terms of convenience and comfort - but more importantly it enables us to do more of the things that we want to.

**Virtual mobility**

Virtual mobility changes the nature of the relationship between economic growth on the one hand, and use of time and energy resources on the other. It is not correct to say that ICT "decouples" economic growth and energy consumption. Energy is still required for the fabrication of equipment and infrastructure and to power both the networks and the environments of the people using them. But economic growth can be achieved with lower levels of energy consumption. How much lower depends on political direction as well as commercial innovation. But just as significant is the impact on the use of time resources. Reducing "travel time" for activities to (virtually?) zero has a twofold effect:

You can do what you want to do more effectively - by liberating all the travel time for that activity that would otherwise be needed. You can do many more things - because virtual mobility opens up many new possibilities for interaction that were previously impractical due to the distance. These add up to what Bill Gates would call "business at the speed of thought" - or at least at the speed of your software and telecoms link. If not now, in due course it should be instantaneous.

Virtual mobility is not just about replacing existing travel

Physical transport, however, is still increasing. In all countries car usage is increasing. In developing countries there is a huge hunger for cars. Air travel, despite the fear of terrorism, will continue to rise. These continuing increases in physical transport prompt scepticism about the possibilities for virtual mobility to replace physical travel. Some commentators suggest that the new technologies are a major contributory factor to the growth of physical transport.

The issues are very complex. ICT is being used to make existing transport systems more effective for both service provider and consumer - in the same way that the telegraph supported the 19th century rail network. IT-related efficiencies may be a factor in the expansion of transport industries, but that is not the same as virtual mobility, where one is speaking of using ICT to do the job that transport might have done.

Virtual mobility may stimulate physical mobility in examples such as: I work with people on the other side of the globe: this leads to meetings involving long-distance travel. I shop online and have goods transported from far-flung places that probably I would never have visited.

However, in terms of the relationship between mobility and economic growth, we can see far greater value delivered for the mileage travelled. In the first example, one needs to compare the mileage travelled in the context of a primarily virtual relationship with the mileage that would have been needed to conduct the business on a primarily face-to-face and paper-based basis. While the business relationship has generated several trips, it has substituted many others that would have been needed in a traditional business setting. Just as importantly, it is a new venture made possible by virtual mobility, and is a contributor to the growth of the company and the national economy.

So virtual mobility is about replacing both existing and potential journeys.

In the second example, of online shopping, the effects on physical transport are hard to predict. The goods are sent from afar: but it is unlikely that additional journeys are required by the carriers, until the volume of such transactions reaches a certain threshold, or unless it is a large or specialist item. But the balance becomes different if instead of a material product, I buy a "de-materialised" product - for example instead of buying CDs from a high street shop increasingly I download music via the Internet. This trend, which is well underway and will become increasingly regularised over the next few years, illustrates the new relationship between economic activity and the need to travel. In fact, by not travelling, I can consume goods (e.g. online music) from a much wider range of sources. And in principle, if I sell music online, I can reach a global audience that I could never hope to reach through physical means.

**Taking it forward**

None of this is to say that virtual mobility will replace all forms of physical transport. Going back to our diagram, it is merely to say that it will become more and more a key factor in economic growth. Other forms of transport will continue to be necessary, and play their part in the economy. How much a part they play will depend in part on demand, but also on the vision of organisations, and the willingness of governments both to regulate environmentally unsustainable forms of transport, and to promote the virtual alternatives. For organisations and individuals, the key questions are how to take advantage the possibilities? That is, how to reduce dependence on physical transport, increase virtual mobility, and take advantage of the time liberated by this to be more productive, have more fun, or achieve a better time balance in one's life.