

### A summary of the seventh report from the Transport Visions Network

This is a summary of the seventh in a series of eight reports to be produced by the Transport Visions Network. The Network is a novel venture to project the views of young professionals into the debate concerning the future of transport and its role in society. It is comprised of individuals who are aged 35 or under from universities, public authorities, consultancies and industry both in the UK and overseas. The series of reports covers eight different topics and aims to build up a coherent vision for the future of transport. Each report is produced through a managed process of discussion involving e-mail debate, a face-to-face workshop and the writing of the report with input from an editorial board of Network members.

The first report in this series, Society and Lifestyles, considered a myriad of issues and trends that are shaping or have the potential to shape the way we live in the future and our travel needs. In the second report, Transportation Requirements, the Network set out twelve guiding principles for the design of future transport systems. In the remaining six reports the Network explores possible solutions to current and emerging transport problems. The Network has not been seeking merely to guess or predict what the future of transport holds in store. In acknowledging that the future is not predetermined and is ours to shape, the reports identify developments we would like to see and perhaps those we should guard against.

The third report in the series, Land Use Planning, considered, through four different visions, the role of land use planning in shaping transport. The fourth report, Vehicles and Infrastructure, presented six visions of how vehicles and infrastructure might change to address current and future transport problems associated with UK surface transport.

The fifth report in the series, Local Travel, offered a range of solutions to problems associated with local travel. Solutions were presented in the form of a 'toolkit for local travel'. The sixth report in the

series, Long Distance Travel developed four different visions which looked at ways to improve the experience of undertaking long distance travel, to reduce the need for long distance travel and to enable more sustainable long distance travel modes to compete with less sustainable ones.

This report offers a range of solutions to problems associated with goods movement. It begins with a consideration of the current and expected future context for the operation of freight and logistics in the UK. It considers present policy approaches to the problems of goods movement before introducing the Network's own ideas and visions which are developed under three different scenarios for the future of society: Going Global; Nation State; and Local Living.

**Going Global** - In this future, society will function on a global level with national and regional boundaries becoming increasingly insignificant. People will consider that spatial range should not act as a barrier to the production and consumption of goods with a resultant stimulation of existing and new international markets.

**Nation State** - In this future, the nation state will constitute the most important context for economic, political and social development. Society will decide that the best way to provide for the production and consumption of goods will be from within its national boundaries with regional development and specialisation replacing international markets wherever possible.

**Local Living** - In this future, society will operate primarily on a local level. Society's production and consumption of goods will be provided, as far as is possible, from within the local community - be that a city, town or village - with local diversity rather than national and international markets being the means of satisfying the demands of consumer choice.

In each scenario ideas are put forward that attempt to improve the efficiency and sustainability of goods movement. A selection of these ideas are summarised below:

## **Going Global**

### **Virtual Globalisation**

Technology could play a vital role in facilitating efficient and sustainable global goods movement. There is strong potential for the transport of certain goods to be replaced by virtual alternatives. For example, developments in Internet and computer technology have enabled downloading of information and in future this could be the principal means by which a wide range of information-based goods and services are provided in 'dematerialised' form.

In future, the ordering of books in hard copy from Internet based companies might be supplemented or replaced by downloading the material. Books may be downloaded in a matter of seconds and the quality of the machine-human interface may be improved to such an extent that reading on screen on a monitor or hand held device may be easy and comfortable. It might even be possible to read a digital book in the bath!

### **Trans-European Rail Freight Networks**

Dedicated high-speed rail freight networks could play a significant role in a scenario in which global goods movement is increasing. These networks would need to comply with trans-European standards relating to inter-operability meaning that more advanced rolling stock, built to standards comparable to the French TGV system, would prevail across Europe. The resultant cuts in journey times would further enable rail freight to compete with other modes.

High-speed passenger rail facilities could also be used for freight transport, particularly for high value, time sensitive freight. Freight trains could be electronically coupled to the back of passenger trains and then electronically diverted off. This kind of operation has been developed in Germany where the Bonn to Berlin rail service separates freight and passenger units within 10 minutes when stationary. Research is also taking place in Germany into the coupling and uncoupling of small train units in motion at around 100 miles an hour where units could join, separate and divert to

different locations. Similarly, the utilisation of superconducting magnetic levitation technology (maglev) pioneered in Japan also has the potential to support very high-speed freight movements.

### **Trans-Shipments Hubs**

The increase in global goods movement would be likely to place pressure on UK and European port capacity. This pressure might be addressed by the development of a single trans-shipment hub for the European continent with feeder services to individual countries. An appropriate location for a single trans-shipment hub to serve the UK in the first instance, and if then successful to serve the European continent, might be Scapa Flow in the Orkney Islands. This could provide an island port with a good length of quayside for trans-shipment where smaller vessels could distribute out to other points.

Off-shore trans-shipment could also be applied to the transport of high value time sensitive cargoes whereby small speedboats could collect goods from larger ships offshore and operate fast ferry services to mainland ports. There would be no need for ships to dock as they could refuel in mid sea. In order for offshore trans-shipment to be a viable option, a more flexible approach to containerised shipping is required. Whilst container sizes are internationally standardised across modes, pallets are not. A standard container could be divided into 8 pallet-sized containers that would plug together to form a container load. Pallets would be separately identified so they could be tracked through the system, an important issue when trying to attract high value products.

## **Nation State**

### **Spoke-to-Spoke Goods Distribution**

In a nation state scenario a spoke-to-spoke system (where goods movement occurs between producer and retailer/consumer directly, without passing through a central hub) could eliminate a significant proportion of goods going through hubs or even one or both local depots, subject to sufficient volumes being generated between specific spokes to allow efficient operation.

Goods with a common final destination or local depot could be identified at the initial packing stage, with routing planned to skip unnecessary legs. Constant intervention from the buyer or

salesperson might be required to prevent the despatch warehouse from sending goods through the hubs. This could occur because despatch staff do not know what happens to goods once they are loaded on trailers and are unaware that they might have a lorry load of goods going to the same place on several different trailers. If despatch staff were trained to plan loads they could spot consolidation opportunities.

An alternative to logistics training for despatch staff would be to employ barcoding, which reduces the need for human intervention in the distribution process. A barcode containing product destination information could be applied at the local depot. Warehouse staff or an electronic carousel would then deliver the goods to the correct delivery bay or storage area. GPS would enable more predictable arrival times for goods vehicles, which would then be more efficiently loaded as goods have already been retrieved from storage. The truck driver would have a barcode reader to check his load is correct. En route the order could be altered electronically to respond to sudden changes.

### **Flexible Rail Freight**

In a strategically planned national economic system centred upon a geographically recognised and predictable network of production and distribution rail freight could play a much greater role in goods movement than at present. This might entail the construction of a dedicated freight rail line from north to south allowing lorries to be placed onto rail units to retain flexibility for end destinations.

An alternative approach to make rail a viable door-to-door option for goods movement would be to apply a mixture of spatial and technological solutions. Smart land use planning could be applied to create production and consumption centres directly connected to the rail system. These production centres could have two sides. On one side, forklifts and straddle carriers could move and load cargo without costly reloading on to road equipment for the last few metres to the production facilities or warehouses. On the other side, lorries and vans could carry out deliveries and pick-ups.

To increase efficiency, wagons could be fitted with side loader arms to load and discharge containers. Trains could then pull into a freight station with

platforms on both sides of the track. Arriving units would be discharged to the right and departing units loaded from the left. If this was supported by similar smart positioning and guidance systems as used by ports then freight trains could be fully automated and be as smooth and efficient as passenger trains. Such developments could remove the need to invest in multimodal terminals.

### **Freight Lanes**

More predictable national goods movement could radically change the operation of road freight resulting in dedicated freight-vehicle-only lanes, or a combination of freight and high occupancy passenger vehicles to maximise use, particularly on motorways. Use of freight lanes could be restricted to fully laden goods vehicles, allowing more reliable and predictable journey times for efficient goods movements.

Road freight vehicles could communicate with one another and lock together in road trains with the prospect of full automation in the long term. Road freight might be further regulated by temporal restrictions on motorway access. Temporal restrictions can create problems regarding the end leg of freight movement, when vehicles enter urban areas and delivery times are restricted by noise regulations and hours of business. This might be addressed by the creation of out of town freight depots where access is available on a 24 hour basis with goods held until appropriate delivery times or transferred to smaller electric delivery vehicles to reduce environmental impacts.

## **Local Living**

### **Local Authority Freight Transport Fleet**

In a society where many goods movements are internalised (vehicle movements that begin and end in the local area) the local authority could have a strategic role in planning, managing and controlling goods vehicle trips. With many small centres of production it is unlikely that individual producers will use their own (fleet of) goods vehicles. With more centres of production, more goods vehicle trips will also take place. The local authority could extend its role of planning and management to franchising out the operation of a fleet of goods vehicles to service the local area. This would enable the central optimisation of patterns of collections and deliveries, including the

allocation of movements to specified routes and times of day.

Given the reduced quantity of goods being moved from production locations, the power requirements needed to move freight will be compatible with electric, solar and water powered vehicles or even man powered vehicles, e.g. bicycles, provided that such modes are able to move goods with sufficient time efficiency. Delivery to the end user could be made to the door by municipal van or to neighbourhood distribution points (corner shops) within walking distance where pre-ordered items could be collected on foot with a shopping trolley.

### **Retailer Consolidation**

More efficient local goods movement could be facilitated by a more strategic approach to grocery retailing. This might involve a clearer separation of retailer functions by product type with shops divided into those that sell fresh goods (freshgrocers) and those that sell durable items (duramarkets).

Freshgrocers would sell fresh produce, but only a few durable items to avoid conversion into convenience stores. Their size would be limited and they could be located near residential areas. Concessions would be available, but restricted to personal ownership and one concession per person. This guarantees their independence and restricts chain building and puts local farmers and shopkeepers on equal negotiating terms. There should be an outlet within walking distance of any urban residential area.

Duramarkets would sell only durables and other household items. They would be much larger outlets than freshgrocers. Economies of scale would be the driving force behind these shops. The size of consumer packages would be at least twice the current standard; enough for a typical family unit. These centres would be connected to the rail system. They would be large enough to warrant full trainloads from central warehouses elsewhere in the country. Such retailer consolidation would increase load factors in private cars from shop to home and reduce delivery runs from factories to shops by bundling cargo flows in logistics centres to enable more long distance freight movement by rail. The redesign of consumer packages and drastic

increase of lot sizes would facilitate optimal load factors for long distance freight movement.

### **Recycle and Exchange Culture**

Local living might be facilitated by a move towards local trading in used goods, whereby unwanted goods are exchanged between individuals prolonging their productive lives, maintaining product choice and dampening new production.

Technology could be used to promote such activities in a manner comparable to the online goods auctions. People could sell goods to the local community, without having to set up retail facilities. Local trading could be undertaken at daily markets offering a wide range of goods. E-procurement could also help to promote local produce as local businesses could bid for contracts quickly and cheaply.

## **Conclusions**

Current goods movement supplies the UK with a mixture of local, national and global products and it is likely that elements from all three scenarios might be included in a desirable future system of freight and logistics. Thus some UK citizens could keep chickens and pigs under their apple trees and sell the produce to their neighbours. A more substantial proportion of the egg, bacon and apple requirements could be met from local and regional growing areas, and a smaller proportion from international trade.

It seems likely that the UK, essentially now a service sector economy, will become increasingly reliant upon overseas trade for manufactured goods and raw materials. However, the rapid and radical changes in society and its consumer demands that have occurred in recent decades suggest that the future is anything but predictable.

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