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**The Implications of the  
24/7 Society for Transport**



## Occasional Paper Number Three, March 2011: **The Implications of the 24/7 Society for Transport**

This occasional paper has been produced by the Independent Transport Commission as part of its mission to encourage debate about current land use and transport policy.

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*Simon Linnett (Acting Chairman), Executive Vice-Chairman, Rothschild.  
Alan Baxter (Hon. Treasurer), Senior Partner, Alan Baxter. Mary Bonar, Head of Rail, Stephenson Harwood.  
Kris Beuret OBE, Director, Social Research Associates. John Dawson, Chairman, EuroRAP.  
Nicholas Finney OBE, Director, Freshwater UK Public Affairs. Elizabeth Gilliard, London Underground.  
Dr Stephen Hickey, Chairman, Community Transport Association. Nigel Hugill, Executive Chairman, Urban & Civic.  
Professor Peter Jones, Director, Centre for Transport Studies, UCL. Dr Gregory Marsden, University of Leeds.  
Steve Norris, Former Minister for Transport. Nicola Shaw, Non-Executive Director, Aer Lingus.  
William Tyson OBE, Consultant Economist. Professor John Worthington, Director, Academy of Urbanism.*

*Secretary: Dr Matthew Niblett, Research Associate, Transport Studies Unit, University of Oxford.*



# Implications of the 24/7 Society for Transport: Executive Summary

## 24/7: A neglected policy debate

The move towards the 24/7 society is already apparent with some 7 million people in Britain each day making use of the hours between 6pm and 9am to visit shops, restaurants, theatres and cinemas and conduct various household business over the internet. By 2020 it is calculated that this will rise at least to some 13 million people, a quarter of the adult population. This trajectory could even accelerate since the estimate does not take account of interventions to improve facilities and the increasing growth in this trend over the past two to three years.

The 24/7 issue therefore raises important and wide ranging policy implications which to a large extent will depend on the direction of political thinking and broader societal trends. However, this paper specifically addresses the implications of moves towards the 24/7 society from the perspective of the transport industry. In particular the question of the benefits (or otherwise) that such a trend would achieve is explored in terms of the different transport modes – specifically logistics, bus/coach, cars, rail, air/airports and walking/cycling.

The results suggest that there are considerable operational difficulties for many parts of the transport system in moving to 24/7 provision. Obstacles include increased security and staffing costs, maintenance and operational problems, legislation and industry conservatism. On the other hand there are also opportunities to ‘sweat the system’, reduce congestion and meet new patterns of consumer demand – not all of which require expensive new infrastructure. The question raised in this paper is whether the transport system is currently poised to meet this challenge.

### Logistics

The logistics industry has made considerable advances towards 24/7 operations due to the global nature of the supply chain, changing

retail hours, just-in-time requirements, home delivery, the need to avoid road congestion, and the pattern of port operations. New technologies have also provided impetus, including automated manufacturing and warehouse operations. However there are still constraints including employment, planning and environmental regulations.

More flexible planning restrictions, on the part of local authorities in particular, could encourage greater windows for deliveries, and encourage the industry to become more efficient. This would also have the benefit of consuming redundant night time highway capacity, thereby releasing spare daytime highway capacity for other traffic without increasing overall demand.

### Buses and Coaches

The opportunities for increased 24/7 provision by bus and coach are strong and unlike rail and air there are fewer problems with capacity and maintenance. In cities where there is fast growth in 24/7 activity, bus operations are also expanding and networks of night time services are developing. Similarly, as coach travel becomes more comfortable and onboard amenities are enhanced there has been growth in 24/7 coach provision. Nevertheless there are obstacles to change and risk within the industry (with notable exceptions) and a different regulatory regime may well be needed, such as requiring local authorities to contract for extra night services. This, however, is unlikely under the current funding climate.

### Cars

An interesting trend in recent years is that car ownership and to a lesser extent car trips have stagnated and there have even been arguments that car use has reached saturation point. There is much debate about why this is happening and whether or not the trend is permanent. One explanation is that, due to

congestion, people are beginning to merge their car trips. Car travel, however, is well placed to take advantage of the extended activities and opening times provided by the 24/7 society, reversing this trend. This is especially likely if public transport providers do not or cannot respond to these new patterns of demand.

### **Rail**

Moves to achieve a 24/7 railway face substantial obstacles through lack of capacity and the need for infrastructure maintenance. In principle, solutions exist which could move more of the rail network towards 24/7 operations. The costs, however, will be substantial and it is doubtful whether this expenditure would be viable nationwide. The best business cases will be found on routes where 24/7 operations will unlock multiple opportunities: for example, additional passenger and freight revenues, service benefits and operating and engineering efficiencies.

### **Air**

Over the next 20 years passenger numbers at UK airports are forecast to more than double to 475 million passengers per annum, while world demand is forecast to triple. Clearly in the light of obstacles to airport expansion this will represent a challenge in meeting demand and one option is to extend working hours to 24/7. Yet the obstacles are substantial and the air industry will struggle to adapt without international co-operation to remove current barriers, as well as advanced infrastructure and safety improvements that require less time for inspections, repairs, and maintenance. Even if these occur, some experts doubt whether the additional costs incurred, let alone noise pollution, will make a 24/7 timetable economically viable. Others point to changes that budget airlines have achieved over the past 20 years and suggest that nothing can be ruled out.

### **Walking and Cycling**

The most significant deterrents to walking and cycling after dark revolve around safety concerns. Even very safe areas are perceived as threatening at night and although CCTV, lighting, designing out crime and greater police presence have mitigated such fears, there are still many people who will not venture out in the dark. On a more optimistic note, as 24/7 activities increase it is likely that having more people around, as well as better transport services, will help provide the reassurance to overcome apprehension. Another concern about walking and cycling in the dark is road safety. Debates continue over consequences of daylight saving hours on casualties, and the impact of reducing street lighting to meet carbon targets.

### **Conclusion**

Our conclusion is that some transport modes are more likely to move towards 24/7 working than others but nevertheless all modes will be affected by a move in this direction. If this happens without adequate response from public transport providers people will increasingly turn to the private car which is available 24/7 and often affords the only means of access at night along with complete flexibility of time, place and availability. Night time and off peak travel by car could also be boosted if congestion charging returns to the political agenda. The challenge is to all sections of the transport industry and government to do more to address these issues and develop policy responses rather than being caught unprepared for change. On a broader basis we need to consider the issue whether obstacles to 24/7 working are a threat to the longer term competitiveness of UK plc.

# The Implications of the 24/7 Society for Transport

## 1 It's already happening

The expansion of social and economic activities over a wider time frame – especially between 6pm and 9am – owes a lot to both *push* and *pull* factors. Much of the growing consumer demand for out of hours provision of consumer goods, banking services, entertainment and leisure activities, for instance, stems from changing features of personal and family life. Furthermore, the attractions of late night provision suits those consumers who see an advantage or even a necessity in widening the boundaries of service availability.

Whether the transactions are conducted online or face to face, the widening of the time-space continuum can have significant benefits for working parents with children, young people in work or full-time education, employees tied to the conventional 9 to 5 treadmill and other groups who have hitherto been denied the advantages of the 24 hour clock. For all groups there is potential appeal in the ability to switch consumption of goods and services, and all the stress this can entail, to a less congested timetable. For suppliers too there is merit in extending time slots including for those working in the global economy. On an even broader basis the possibility of making better use of buildings such as universities and offices by using double shifts offers an enormous potential benefit.

Therefore it is not surprising that the move towards the 24/7 society is already apparent with some 7 million people in Britain each day making use of the hours between 6pm and 9am to visit shops, restaurants, theatres and cinemas and conduct various household business over the internet. By 2020 it is calculated that this will rise to some 13 million people, a quarter of the adult population.<sup>1</sup> The demand curve continues to rise quite sharply even if the pattern of provision is heavily skewed to a narrow range of activities and does not conceal the fact that many potential out of hours pursuits – libraries and museums, local transport, educational services - are more likely to be contracting rather than expanding.

These themes raise important and wide ranging policy implications.

However, this paper specifically addresses the implications of moves towards the 24/7 society from the perspective of the transport industry. In particular the question of the benefits (or otherwise) that such a trend would achieve is evaluated in terms of the different transport modes.

1 Martin Hicks (2006) *East of England Scanning Report No 2: The 24/7 Society: Implications for the East of England* [Chimera working paper CWP-2006-05] available at: [www.essex.ac.uk/chimera/content/pubs/wps/CWP-2006-05-MH-Scanning-Report2.pdf](http://www.essex.ac.uk/chimera/content/pubs/wps/CWP-2006-05-MH-Scanning-Report2.pdf)

## 2 The Implications of the 24/7 Society for the Transport Industry

### 2.1 The potential benefits and costs to the transport industry

What are the potential benefits and costs to the transport industry of a move towards a 24/7 society? The conventional 6 a.m. to 12 a.m. transport system, particularly where associated with twin demand peaks of weekday rush hours, incurs redundant and wasted supply such that user utility is also suppressed.

For some modes, working 24/7 would enable transport assets to be used more intensively and productively. For example, buses and trains would no longer over-night at the depot but could be used to carry passengers and roads would carry more traffic per lane per day. It is also possible that smoothing the travel demand profile over a 24/7 timeframe could provide better returns and offset the expense of higher operating and maintenance costs.

Given these benefits to the industry, why are we not seeing a faster move towards 24/7 operations? The obstacles facing the development of the 24 hour transport system are various, and in many cases mode specific. This section therefore considers the costs and benefits of 24/7 operations from the separate perspectives of the logistics/freight, bus/coach, rail, air industries, car use, walking and cycling.

### 2.2 Implications of a 24/7 Society for Logistics and Freight

#### Ahead of the game

The logistics industry has perhaps made the greatest advances towards operating on a 24/7 schedule. Several key reasons have provided incentives for this development:

- Consumer and retail demand, particularly for next day delivery, as well as manufacturing demand for 'just-in-time' delivery, has ensured that ports and freight have had to adapt to night operations.
- The need to maximise capital investment has encouraged 24 hour operations at ports.

- New technologies, such as automated warehouse picking in the dark, have helped to overcome some of the practical obstacles to night time work.
- Faster delivery times and restrictions on driver hours require the avoidance of congestion at peak times on the trunk road network.
- Maintenance schedules are also more efficient when spread over a 24/7 period and which would also offer the possibility of reducing average trip length.

The globalisation of trade means that the demand for goods movement is increasingly influenced by worldwide schedules.

#### Current Barriers

A few barriers continue to stand in the way of complete 24/7 operations. These are either external regulatory issues, or mode-specific challenges.

- External regulatory constraints include limited Sunday opening hours in England and Wales, night-time lorry bans, peak-hour pedestrianisation in urban areas, time based parking and urban delivery restrictions. Some of these are now being challenged, and indeed a number of major logistics operators have argued for a day time rather than a night time lorry ban in London.
- Road congestion management would become more difficult as the window of opportunity to maintain highway assets and keep them in good order is reduced. In the early years of highway management, roads were maintained between the two daytime rush hour peaks. Now many roads are maintained at night time, often from about midnight, when traffic flows are low to very low. A 24/7 system will increase traffic flows between 0000 and 0600 hours when this maintenance occurs.
- There is concern that road accident rates (not to be confused with numbers) could increase because of increased travel in darkness, and the fatigue problems faced by



people operating vehicles during “sleeping hours”. On the rail, tram and tube network, capacity is constrained by the pattern of overnight and weekend route closures for infrastructure maintenance and renewal work as well as the limited availability of diversionary routes suited to freight trains. Rail freight faces problems with maritime containers that need an “envelope” or loading gauge to accommodate their width and height.

- Air freight faces particular challenges if it wishes to increase overnight operations. First, the aircraft would have to comply with the very tight noise regime. Secondly, and crucially, around 85% of air freight at Heathrow (and this is typical of most major airports) arrives in the belly hold of passenger aircraft, and is dependent upon passenger considerations (discussed below). Finally, since night quotas are already fully used there would need to be regulatory change. In the longer term, and especially if there are to be no additional airports or runways, night-time airport closure may become hard to defend. Alternatives such as stricter aircraft noise limits may have to be accepted in return for continuous operation.

### **Conclusions**

As the move towards a 24/7 society increases, it is possible that opportunities will arise for removing some of the above barriers experienced by the freight and logistics industry. These include:

- More flexible planning restrictions on the part of local authorities, and better management and design of buildings, should all encourage greater windows for deliveries, and encourage the industry to become more efficient.
- Greater flexibility would permit new delivery options, for example, depot-shop deliveries could be done at night. This would have the benefit of consuming redundant night time highway capacity and in the process release spare daytime highway capacity for other traffic. However, 24/7

use of the highway system will only reduce congestion so long as demand patterns even out rather than increase overall transport demand.

Necessity is the mother of invention. Perhaps a move towards 24/7 freight use of the highway system will lead to construction of low maintenance roads. There could also be more stringent requirements to use quieter lorries. The industry has a reasonable record on developing innovations, as witnessed with its long life self-cleaning traffic lights and low emission engines, but usually only when forced to adopt these.

The overall view of the industry is that the whole supply chain will become more efficient as the move towards a 24/7 society continues, with consequent savings for the economy.

### **2.3 Implications of a 24/7 society for Buses and Coaches**

Unlike rail or air travel, fewer regulatory and maintenance obstacles stand in the way of 24/7 bus and coach provision. Night buses are a feature of a number of British cities, most notably London, while true 24/7 provision already exists on some routes, such as Oxford to London. In some cities, too, as shop opening hours have been extended into the late evening, urban bus service frequencies on certain core corridors have also been increased at these times without there being a full 24 hour service.

The current regulatory environment for road passenger transport does not generally favour the expansion of late evening or night bus services. Commercially operated bus services often finish early or reduce to severely curtailed frequencies in the evenings. The provision of tendered, supported evening/night services is often minimal or non-existent, factors which are likely to become worse as Government restrictions on local authority finance grow. In addition, controls on private traffic often cease after the evening rush hour, with free or cheaper parking, fewer restrictions on where to park and schemes such as the London congestion charge not applying between 6pm and 7am.

## Factors affecting Night Provision

A number of issues need to be resolved if we are to see the 24/7 provision of Coach and Bus services develop more widely:

- Where nocturnal bus or coach provision exists, it relies either on a strong night culture (as in Brighton and Edinburgh) a key underlying demand such as airport traffic, or on long-distance demand such as between London and Scotland.
- The strong commitment of the local operators and transport authorities is important. In London the extensive night bus network is only possible because of the regulatory control that TfL has over the network and, of course, the control it has over bus contracts, including financing.
- The co-ordination of departures from a common town/city centre location (e.g. buses once an hour on the hour on each of the principal radial corridors, with similarly co-ordinated arrivals back from the suburban/out-of-town termini such as in some continental cities and in Edinburgh) would facilitate familiarity with the services, enable interchange between different routes; and enhance security, as passengers would be present at the main boarding point in significant numbers as the designated departure times approached.
- Night provision would require enhanced and more widely available real-time information supported by electronic Help Points at interchanges or key stops and extended opening hours for Traveline phone enquiry services.
- Taxis would be a crucial element in supporting core bus and coach services, including providing alternative travel options if bus services are cancelled or delayed and ferrying passengers from night buses to their final destinations.
- Increased vehicle utilisation might require additional spare vehicles and perhaps a round-the clock maintenance schedule. Large operators with big garages may be

better able to cope with this, as in London.

- There would be a need, especially in relation to coach services, to increase opening hours of coach terminals (including facilities such as kiosks / cafés), in order to provide service right throughout the night.
- Working hours would need to be extended both for drivers and service staff. Realistically, night driver schedules should be moved onto regular rotas, rather than relying on overtime which would be costly and vulnerable to cancellation because of crew shortages. It is possible that there would be separate crews for day and night services on a permanent basis. Significantly, working outside the 9-5 time span is not necessarily seen by crews as ‘overtime’ in any case.

## Security

One of the most serious factors affecting late night bus travel is personal security and there is no doubt that the risk of alcohol-fuelled violence, and opportunistic muggings rise in the hours of darkness. Protecting customers and staff, and improving perceptions of safety will require further measures. Some of these features are already evident in larger cities where extensive night bus systems operate.

- There would need to be additional security staff around bus/coach terminals and additional staff training in customer care and conflict reduction. Furthermore, we would need to see more availability of the British Transport Police and other police services.
- There would also be a need for key staffed stops as well as additional lighting and enhanced CCTV. This might involve assignment of specific city centre bus stops to night bus services, and assignment of additional security staff to those stops (to speed loading times).<sup>2</sup>
- The costs of these measures (for security, maintenance and operations) could be met through separate publicity and branding for night service ‘corporate customers’

2 As an example, policies used in Glasgow (which has an extensive Friday and Saturday night bus network) can be seen at [www.firstgroup.com/ukbus/glasgow/about\\_us/transforming\\_travel/safety\\_first.php](http://www.firstgroup.com/ukbus/glasgow/about_us/transforming_travel/safety_first.php)



of the bus service, such as nightclubs, theatres and sports venues. Provided that information and branding was clear, the market would also support special fares for night bus services (higher than normal and probably simpler to reduce time and ‘stress’ caused by finding the correct money) such as the standard £2.20 Night Bus fare levied by Brighton & Hove Buses.

### **Conclusions – Bus and Coach**

The opportunities for increased 24/7 provision by bus and coach are strong. Bus and coach demand is more sensitive to broader trends in UK society, and unlike rail and air, there are fewer problems with capacity and maintenance. Obstacles include increased security and staffing costs, and further moves towards 24/7 provision will require radical increases in the amount of 24/7 activity in society at large. In cities where this exists we are already seeing operations expand. As coach travel becomes more comfortable and onboard amenities are enhanced, we could also see greater demand for longer distance coach services at night: a phenomenon apparent from the growth of the national network of coach services in Spain operated by a subsidiary of National Express Group. Nevertheless there are obstacles to change and risk within the industry (with notable exceptions) and a different regulatory regime may be needed, such as requiring local authorities to contract for more night services.

## **2.4 Cars and the 24/7 Society**

### **Introduction**

Car Travel remains the dominant mode of passenger transport, particularly for medium and longer distance domestic journeys.<sup>3</sup> The flexibility of car travel and the fact that highways remain permanently open ensure that it is well placed to adapt to 24 hour 7 day living. We can drive our cars at any time of day or night without needing to check timetables or suffer the fear of being stranded as a result of a missed connection. This is underlined by the 24/7 service offered by the emergency breakdown services.

Some practical obstacles remain, however, in the form of parking provision, highway maintenance schedules, and the opening hours of petrol stations.

### **The Saturation Phenomenon**

An interesting trend in recent years is that car ownership and, to a lesser extent, car trips have flattened out. Some, including David Metz, have even suggested that car use has reached saturation point in Britain. A study by Adam Millard-Ball and Lee Schipper indicated that car travel reached saturation point in industrialised countries once GDP per capita reached \$25,000 to \$30,000.<sup>4</sup> There is much debate about why this is happening and whether or not the trend is permanent.

One explanation is that due to highway congestion, people are beginning to merge car trips in order to avoid rush hour travel. The extended activities and opening times of the 24/7 society clearly enable greater opportunities to schedule one’s timetable to avoid the worst periods of congestion.

### **Factors affecting Night Provision**

One of the key factors affecting night provision is the role that the 24/7 society could play under a congestion charging regime. One scenario is that it would enable more people to avoid the highest peak time charges without detriment to their life styles. The rolling out of a national road pricing scheme could also encourage 24/7 car travel if charges are varied at peak times.

Road maintenance is now carried out mostly at night. Indeed, the Highways Agency’s ‘network occupancy management’ scheme now restricts any lane closures or traffic restrictions between 6am and 8pm. This is likely to create more difficulties for night travel by car, but the existing spare capacity overnight is such that traffic would have to increase significantly for congestion to become a serious obstacle.

3 The Independent Transport Commission discovered that car travel accounted for 80% of all domestic journeys over 50km. See *Long Distance Travel in Britain: Prospects in a time of Uncertainty* (ITC March 2010).

4 Adam Millard-Ball and Lee Schipper, ‘Are we reaching peak travel? Trends in passenger transport in eight industrialised countries’, *Transport Reviews* (2010).

Parking controls will also influence the development of 24/7 car travel. At present there are considerable advantages to overnight travel since parking restrictions are often limited to daylight hours, and charges are often reduced or free at night and on Sundays. Most municipal car parks are open 24 hours, but some pricing schemes are inflexible at night, charging a large fee for overnight use. Car Parks will need to move towards 24 hour provision and flexible pricing strategies to adapt to changing use patterns. Furthermore, security and vandalism is often an added concern at night, so patrols by traffic wardens and security guards may have to increase during these hours.

Increased night travel will also require opportunities to refuel round the clock. Car travel is already well served in this area with many petrol stations open 24 hours. Technological change may influence this issue, however, particularly if there is significant take up of electric vehicles. In the absence of widespread charging stations, many consumers may feel it better to recharge their vehicles at home, particularly overnight when tariffs are often cheaper.

Finally, we must consider the effect of changing leisure behaviour patterns on car travel. Traditionally, evening car travel has been constrained at night as a result of restrictions on alcohol consumption before driving. This encourages shared car travel or public transport use. As evenings are used increasingly for work or business related activities, it is possible this will result in increased car use. There is also evidence that alcohol consumption has been declining since 2000, which is likely to lessen constraints on car travel.<sup>5</sup>

### **Conclusions - Car**

Car Travel is unlikely to decline significantly in the absence of cheaper and/or more demand responsive public transport alternatives. It remains the most flexible form of passenger transport, and well suited to the adoption of a 24/7 society. Initiatives to develop congestion charging zones or road pricing are likely to

increase use of the roads during off peak hours, though road maintenance policy will restrict capacity overnight on some key routes.

Finally, in relation to 24/7 living it is likely that journeys by car will increase if, as suggested elsewhere in this paper, bus and train operators find it more difficult to service trips outside core hours of demand. Without increased public transport provision it will be the car that serves the additional demand for 24/7 travel and there are clearly concerns about increased carbon emissions if this happens.

## **2.5 Implications of a 24/7 Society for Rail**

Passenger rail is poorly geared towards 24/7 operations at present. Very few passenger trains currently run on the national rail network during the night hours, especially between 23:00 and 05:00. A related challenge is to achieve something approaching a “7 day” railway, since so much of the British rail network cannot be relied upon for travel at weekends as sections are closed for maintenance and renewal work.

The key obstacles are capacity limitations, maintenance requirements, and logistical problems and cost.

### **Rail network capacity utilisation**

An understanding of the use made of the rail network’s existing capacity is key to comprehending the impact of a move towards a 24/7 passenger railway.

- On weekdays, the passenger business uses much of the rail network’s capacity. The profile of usage over each day reaches two peaks, during the morning and evening rush hours. The relative height and timing of the two peaks varies from route to route across different areas of the country. At present, most major routes are already running at capacity during these peak times, resulting in overcrowding on passenger trains.

5 Office for National Statistics, available online at: [www.statistics.gov.uk/downloads/theme\\_compedia/GLF09/GLFSmoking-DrinkingAmongAdults2009.pdf](http://www.statistics.gov.uk/downloads/theme_compedia/GLF09/GLFSmoking-DrinkingAmongAdults2009.pdf)



- Outside rush hours, spare capacity is used to accommodate substantial freight movements, partly on the inter-urban trunk main routes (for example, the West Coast and Great Eastern lines) but also on heavy haul routes (for example, bringing coal from the ports to power stations).
- To some extent passenger demand can be influenced through fare management, which may introduce additional, subsidiary, peaks. For example, a secondary peak can arise around the first trains after the morning rush hour when cheaper off peak tickets are available.
- By night there is a very different use of network capacity. A few passenger trains operate, for example on the London – Gatwick line, between the North East, Yorkshire and Manchester Airport, and the London to Scotland sleeping car trains. But most of the activity relates to freight trains and a large infrastructure engineering programme.
- In summary, by day and night, throughout weekdays and weekends, under existing operational and engineering practices much of the railway's capacity is already being used. Capacity for additional services is especially constrained on key inter urban trunk routes and around major conurbations.

### **Logistics and Rolling Stock**

The logistical challenge of 24/7 passenger rail operations is unlikely to be caused by availability of vehicles. On most routes – especially those operated by electric trains - there is plenty of passenger carrying rolling stock standing overnight in sidings out of service and not undergoing maintenance. Additional operating staff could be recruited to run these trains for night services but this does raise the issue of cost especially in an industry with powerful union representation. But the operation of more passenger trains during the night will need capacity on the network to be made available, impinging on that currently used mainly by freight and for infrastructure engineering.

Additional capacity for freight traffic displaced by an enhanced overnight passenger service in the conurbations could be accommodated on improved alternative routes or by diverting trains away from areas where passenger trains would be required. A good example of this is the way that growth in maritime container traffic from the port of Felixstowe to the Midlands and North West will soon be routed through Ely and Peterborough, rather than via the existing freight route that uses very busy lines through London. More projects could be developed to allow freight trains to avoid busy passenger train areas, providing benefits for passenger trains both at night and by day.

### **Maintenance Issues**

Where it has not been practical or efficient to carry out infrastructure maintenance and renewal during weekdays and weeknights, over much of Britain there are sequenced closures of sections of route on Saturdays and Sundays to carry out the necessary work. A change which Network Rail have been considering to secure extensive routes where passenger trains can operate 24/7, free from interruption by engineering works, is going to be complex and potentially very expensive.

- New infrastructure engineering technologies can help to reduce the time taken for engineering work, so improving the time that routes are open for traffic. For example, recent years have seen Network Rail introduce more efficient technologies for track renewal.
- Additional parallel tracks can offer improved opportunities for maintenance without closing down the route completely. Some route sections in Britain that have 4 or more tracks already offer near 24/7 access (but still with some reduction in capacity).
- Progress can be made on the extensive two track network through investment in flexible signalling. This can allow trains to continue to run in either direction on any line, avoiding those sections where engineering activities are taking place.

- A fundamental requirement is the need to ensure track worker safety when trains are passing close to a work site. Investment in modern equipment can allow some inspection, maintenance and renewal activities to take place quickly and efficiently on one line whilst the adjacent line is being used by services.

These initiatives will all help to move towards the 24/7 railway, but none offer a low cost and immediate solution to the problem of accommodating both 24/7 passenger services and work on the infrastructure.

### **Cost**

Cost is likely to be the strongest deterrent to any significant change unless and until there is a fundamental change of public financial policies and a large increase in public activity between 6pm to 7am. It would be very expensive to run passenger trains overnight, e.g. on suburban, intermediate distance or intercity routes; keeping a line open for a low frequency service would cost almost as much as for a frequent operation; and running a train for a few passengers almost as much as running it full. Opportunities might be limited to a small number of the most important services, e.g. extending London-Gatwick trains to Brighton. There has been discussion for years as to whether it would be possible to extend the hours of operation of the London Underground, e.g. by an hour later at night, though this would provide an even shorter window for engineering work.

### **Conclusions - Rail**

Moves to achieve a railway open 24 hours every day face substantial obstacles through lack of capacity and the need to provide opportunities for infrastructure maintenance. In principle, solutions exist which could move more of the rail network towards 24/7 operations. The costs, however, will be substantial and it is doubtful whether this expenditure would be viable nationwide. The best business cases will be found on routes where 24/7 operations will unlock multiple opportunities: for example, additional passenger and freight revenues, service benefits and operating and engineering efficiencies.

## **2.6 Aviation and the 24/7 Society**

### **Introduction**

In the second half of the 20<sup>th</sup> century, aviation achieved for our generation what the railways did for the Victorians: it transformed our perceptions of time and speed by establishing fast and reliable connections to every country in the world. Unlike land-based transport, however, aviation faces some specific problems when considering the question of 24 hour operations. For international flights these include, amongst others, international time zones, over-flying rights and restrictions or curfews on night arrival and departure times. These constraints introduce another level of complexity and add to the variety of reasons that makes full 24 hour airport operation more difficult to achieve than might be imagined.

This section of the Paper examines whether aviation could operate at full capacity on a 24 hour cycle. The assumptions below are largely based on international operations and look at passenger, airport, airline and environmental considerations.

### **Passenger Perspectives**

There is little evidence of any large-scale demand from passengers for full 24 hour operations. Several factors contribute to this situation:

Over the years international flight schedules have evolved so that early and late departures achieve appropriate early and late arrivals, at home and abroad, so as to suit time zones and curfews. Of course a number of holiday charter flights leave the UK late at night and do arrive at, for example, Palma Mallorca in the middle of the night, although usually associated with onward coaching. Large UK airports already come close to 24/7 operation, with lengthened check-in times now requiring passengers to be at the departure airport for, say, an 06.00 flight at around 04.00. Full 24/7 operation would require that the societies at both ends of the trip adapt to 24/7 passenger needs, as with the coaching at Mallorca. For international travel, passengers exhibit preferences based on the time and frequency of flights. For example surveys

demonstrate that people living near Gatwick will fly from Heathrow or Stansted even when there is a service to their destination from Gatwick. Their choices are predicated not only on availability and cost, but also suitability of schedule and, critically for the business traveller, frequency.

### **Airports**

The busiest airports are already running an 18 hour day. There are particular issues to resolve in achieving 24 hour operations.

- Many busy airports already lack operational resilience and minor incidents therefore have a disproportionate impact. Even Heathrow, with two runways and currently operating at 98% of capacity, needs time for renewing itself. The great majority of UK airports have single runways and these, along with taxiways and stands, have to be inspected and maintenance carried out. Terminals must be cleaned, jetties and baggage systems overhauled. Time has to be permitted for this renewal, and the window for doing so is already tight between 2330 and 0430.
- Night flight quotas or curfews exist in most countries, rendering 24 hour international operations difficult to achieve. There is a night flight quota allowed by the DfT at Heathrow but only for the most modern, quietest aircraft, permitting about 2550 movements in the winter period and 3200 during the summer. However, improvements in quiet aircraft technology and availability may hold the key to the future, enabling night flight bans to be reduced, although landing noise remains a problem. The recent decision to halt any further runway development in the South East may result in airlines seeking to enlarge the night jet quota, although one may assume that this would be only on key routes. A general relaxation would be politically difficult.
- Staffing for a full night shift of passenger handling staff would increase airport and airline costs.

### **Airlines**

Modern jets have a flight envelope constrained by speed and fuel capacity. The practical limit for non-stop flights is about 18 hours, typically found today on journeys between East Asia and cities on the eastern seaboard of North America. Planning for 24 hour scheduling also presents difficulties in the current climate of industry change, where many smaller airlines are being sold or merged. Other considerations include:

- Economic obstacles. The major carriers on long haul routes operate a financial model based on yield per passenger, dependent upon revenues from First Class, Business and Premium traffic. Given the higher marginal costs of 24 hour operation the tickets would probably carry a premium and raises the question as to whether premium passengers wish to travel at unsocial hours. In contrast short haul flights are increasingly dominated by low cost/low fare flying and yield is determined by high load factors and intensive aircraft utilisation. Allowing for aircraft maintenance requirements it may not be possible to increase the number of turn-rounds on the existing fleet.
- Operators prefer to get their aircraft to home base with the last flight. Hence the W pattern used by medium haul operators; for example Gatwick-Malaga-Manchester-Tenerife-Gatwick. This enables the base staff to clean, fuel and maintain the aircraft ready for the next morning. Moving to a 24 hour operation would not fit with these practices, and airlines would have to consider buying/leasing more aircraft.
- Aircraft utilisation patterns aim to maximise on aircrew hours. 24 hour operation would need additional aircrew; and since staff costs are 12% of operating costs the airlines might balk, unless revenues were clearly going to be sufficient to justify this.
- International aviation is grounded on bilateral agreements between Governments. It is likely that some governments would refuse permission for 24 hour operation, based on issues such as domestic night-time curfews. Since bilaterals seek to

achieve a balance of benefits, operating practices that may not suit one party, such as 24 hour travel, are difficult to justify.

- Air traffic control capacity might be an issue. Some parts of the world's skies are getting distinctly crowded, and could be made worse with 24 hour operations.

### **Environmental issues**

Noise and emissions are key issues surrounding aviation, both of which would be affected by 24 hour operations

- Although the noise footprint around airports has more than halved in the last 40 years, and the new generation of aircraft is even quieter, noise from aviation cannot be removed. 24 hour operations would add to noise disturbance, even with quieter aircraft. Noise on the ground would also be a factor, from taxiing and start-ups of aircraft, and the extra land transport necessary to service the airport.
- Legislation against noise is increasing, as are tighter specifications on night-flying aircraft. At some point we can expect Europe-wide regulation on this issue.
- Harmful emissions from both aircraft and connecting road traffic include PM10 and NOx. These would be increased by 24 hour operations, since air quality benefits at present from a period of overnight respite.
- The major emissions issue at present is CO<sub>2</sub>, and the amount emitted by aviation in the UK is forecast to double by 2030. If 24 hour operations result in a less crowded timetable, and reduced stacking of aircraft, this could contribute towards lower aircraft emissions. It is likely, however, that the opposite would occur, either through increased overall demand, or through additional flights with fewer passengers.

### **Conclusions - Air**

Over the next 20 years, passenger numbers at UK airports are forecast to more than double to 475 million passengers per annum, while world demand is forecast to triple, meaning that more of us will be flying further more often.

So will 24 hour operation be one of the solutions to handling this level of demand growth in the UK? The obstacles are substantial. Yet the changes achieved by the low cost carriers over the past 20 years suggest that nothing can be ruled out.

If we do move to a 24/7 society and if the airline industry seeks to adapt there will need to be international collaboration on removing current barriers. Even if these occur, one may doubt whether a full 24 hour timetable would be economically viable.

## **2.7 Walking and Cycling and the 24/7 Society**

### **The Importance of Safety**

One of the most significant deterrents to walking and cycling after dark is concern about personal security. Even very safe areas are perceived as threatening at night and although CCTV, lighting, designing out crime and greater police presence have mitigated such fears, there are still many people who will not venture out in the dark. The reduction of street lighting by councils as a result of carbon cuts could add to such fears.

Another concern about walking and cycling in the dark is road safety. One of the key determinants here is lighting provision, since most accidents occur at dusk or at night. There has also been a long standing debate about the impact of Daylight Savings Hours on casualties. According to RoSPA (The Royal Society for the Prevention of Accidents) changing from GMT to Single/Double Summertime with the resulting lighter evenings would result in around 450 fewer deaths and serious injuries on the roads each year.

On a more optimistic note, as 24/7 activities increase it is likely that having more people and police around, as well as better transport services, will help provide the reassurance to overcome apprehension.



### 3 Conclusions and the Future for Transport Policy

Whether viewed from a push or a pull perspective the 24/7 society seems less a relentless force than a loose constellation of impacts. The general direction is certainly towards a more flexible supply and demand of goods and services but the key question relates to the general momentum of this phenomenon and what drives it.

There are several influences on this development:

#### Towards the 24/7 Society

- An *incremental* process that builds up a critical mass through a series of steps. This establishment of a routine would tend to apply more to online than face-to-face transactions. Related to this is an *exclusion* element whereby normal 9 to 5 face-to-face activities become dwarfed by the sheer volume of after hour traffic. This could apply to areas like banking, vehicle licensing, income tax returns and TV licensing. The momentum here is clearly in the direction of 24 hour operations.
- *Interconnectedness* whereby one or more processes overlap with others and move the juggernaut along. The habit of online transactions is an obvious case but the same might apply to late night face-to-face activities in which shopping, entertainment and socialising were interlocked. The *interdependency* of different elements in the supply chain – suppliers, logistic firms, producers – also tends to ratchet up this vision of round the clock performance.<sup>6</sup>
- *Global* pressures could also accelerate the 24/7 society – not just working to American hours, as has been traditionally the case for the financial sector, but increasingly to Asian time bands thereby affecting the global supply chain.
- Finally there is the appeal of the *metaphor* of

the 24/7 society and the sense of entitlement it inspires which can be a highly significant factor in the growth of after hours activities. Again this applies more to online than face-to-face interaction. Reputations and status can hang on the mastery of information technology. The expectation of instant access is important too.<sup>7</sup> There are broad *power* implications here with a growing band of consumers using their superior knowledge and experience to monopolise resources and push the 24/7 revolution along. This can happen with both online and face-to-face transactions, whereby computer access in the former and personal transport, control of working hours and leisure time in the latter are crucial.<sup>8</sup>

#### Obstacles to the 24/7 Society

- *Government and political attitudes*. Although initiatives in flexible and deliverable working, licensing hours, broadband speeds, supermarket hours and sites give some impetus to 24/7 culture there are as many if not more obstacles such as restrictions on opening times, working time directives and infrastructure procurement and investment.<sup>9</sup> Trade Unions, especially (but not exclusively<sup>10</sup>) those representing transport workers, would resist the associated erosion of the concept of shift work and overtime.
- The lack of our ability to reduce *externalities* is an obstacle. Much of the resistance to the 24 hour society lies in the negative externalities of crime, stress, lack of transport, lack of access to online services, regulatory impacts, etc.<sup>11</sup> Thus organisations such as the Future Foundation may have a point in stressing the declining special character of Sundays but at the same time exaggerate a similar convergence of night and day consumerism.<sup>12</sup>

6 *Management Issues* (July, 2008) 'Business never sleeps – and neither will you'

7 *Management Issues* (Oct 2005) 'Whenever, wherever, however'

8 *Third Sector Foresight* (NCVO, Jun 2010) 'Always on Society'

9 *Parliamentary Office of Science and Technology* (Nov, 2005) '24 Hour Society'

10 For instance the opposition from Universities to 'double shifting' the academic year

11 See Special Edition of *Criminology and Criminal Justice* (November 2009 vol. 9 no. 4) on safety at night including articles by Crawford & Flint on 'Urban safety, antisocial behaviour and the night time economy'; also Marion Roberts 'Planning, urban design and the night-time city: Still at the margins?'

12 Future Foundation (2004) 'The Shape of things to come'

- There may also be *physiological* factors stemming from our need for exposure to daylight as epitomised at the extreme by seasonal affective disorder (SAD), the health benefits of sunlight, and an innate sense that night-time is for sleeping.
- Finally, we must ask whether it would be healthy for society to develop separate night and day cultures and what would this do for community cohesion? Would this also divide society by age - support for longer hours declines up the age gradient which may reflect less generational discrepancies than the specific stage the household has reached. Consumers without children at home can revert to more flexible time schedules and locations.<sup>13</sup>

### **The implications for transport**

It would appear that there are considerable operational difficulties for many parts of the transport system in moving to 24/7 provision, though the down time on the railways is increasingly diminishing and suggests that 24 hour rail provision would require a less painful transition than is often imagined. The logistics industry is further along the path towards 24/7 but there is a long way to go. In addition, the car is of course available 24/7 and often affords the only means of access at night along with complete flexibility of time, place and the availability of full service on motorways and at motorway service stations. Night time and off peak travel by car could also be boosted if congestion charging returns to the agenda.

So our conclusion is that some modes are more likely to move towards 24/7 working than others but nevertheless for all modes there will be knock on effects (and the trends are definitely in

the direction of longer opening days). There is certainly a lot more that the industry could do to make better use of the system and respond to this growing demand. The challenge is to all sections of the transport industry and government to do more to address these issues, to ascertain their benefits and to develop policy responses rather than being caught unprepared by change.

### **Future Questions for Research**

The findings in this paper are intended to generate a broader debate on the challenges we face as the 24/7 Society develops. The ITC recognises that a good deal of further research is required in this area to inform and better determine policy. In particular, we recommend work on the following areas:

- We need to research what the adoption of 24/7 transport systems will mean for the planning our cities. Placemaking may need to consider noise levels and safety issues to a much greater extent.
- Further work is badly needed on the national and international regulatory obstacles standing in the way of a 24/7 transport system. Related to this is the need to calculate the cost to the British economy of failing to overcome such obstacles.
- It is possible that a 24/7 society will result in less travel overall as technology delivers the ability to transact business and pleasure without having to leave home. More research into the effect of technology on how we schedule our daily movements would be welcomed.
- We need to understand better the consequences and costs of increased night travel for the provision of essential services, including the emergency services and maintenance of utilities.

<sup>13</sup> See Partridge C (2003) *Consumer Futures*, Chimera, University of Essex internal report, and Hicks (2006) 'The 24/7 Society', *op. cit.*

## **INDEPENDENT TRANSPORT COMMISSION** **Registered charity No. 1080134**

**Acting chairman: Simon Linnett**  
**Secretary: Dr Matthew Niblett [matthew.niblett@keble.oxon.org](mailto:matthew.niblett@keble.oxon.org)**  
**c/o Dr M. Niblett, Keble College, Parks Road, Oxford, OX1 3PG**  
**Tel. 44 (0) 7813 174582**

**[www.independenttransportcommission.org.uk](http://www.independenttransportcommission.org.uk)**



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Further copies available from The Secretary, Dr. Matthew Niblett

email: [matthew.niblett@keble.oxon.org](mailto:matthew.niblett@keble.oxon.org)

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