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THE TRAFFIC GENERATION GAME

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There is no guarantee that greater mobility leads to greater satisfaction. (OECD 1977)

INTRODUCTION

Why the "traffic generation game"? The real problems of modern transport are associated with excessive use of motor vehicles. The processes by which this traffic is generated can be likened to a game in two ways. Firstly, the rules of a game have no intrinsic merit; they are designed to make the game playable. Secondly, the appeal of a game lies in its detachment from real life. So it is with traffic generation. The tax breaks, subsidies, fare levels and planning rules appear to be designed to play a perpetual game of "motorisation", which in reality has little to do with solving transport - related problems. New rules are sometimes added, like "freedom of consumer choice" and "non- interference with market forces", but again the links with reality are tenuous. There is, for example, little freedom to choose a lifestyle that does not involve dependence on the car, whilst the market in clean air and quiet surroundings is grossly interfered with. Questions need to be asked about whose freedom, and which markets are to be protected, and these are too serious to be answered by game playing.

LAND USE PLANNING AND LOCATION CHOICE

All travel arises from the benefit of doing different things at different locations, and transport is thus a means to an end rather than an end in itself. It follows that transport is a cost and not a benefit, and that society will be more efficient if, for a given level of economic and other activity, the amount of travel can be reduced. The aim should therefore be to reduce overall transport costs, not just the private costs of travel but including the costs of supply, and the unwanted environmental and safety costs. Unfortunately, the trend is in the opposite direction. Households spend growing amounts on travel, journey distances are increasing, freight movement is increasing, and as larger proportions of journeys are made by private motor vehicle, the external costs of travel are becoming unmanageable. Much of this is assumed to be an inevitable if not wholly desirable consequence of economic growth, and the one third increase in car traffic between 1980 and 1988, for example, has been presented as an indicator of economic recovery and therefore "a good thing". The unpleasant symptoms of this traffic growth, including environmental damage and congested transport facilities, arouse increasingly passionate feelings, but it is the overall value of the traffic itself that needs to

be questioned. The fundamental objective of the spatial aspects of planning should therefore be to create settlement patterns which allow people to have better lives with less traffic. The extent to which people make travel and location choices that are consistent with this objective, however, depends on more than simply making such choices possible. Location planning therefore must be integrated with other aspects of transport, fiscal and social policy. This definition of the integration of land use and transport planning takes us well away from earlier concepts which led in the 1960s and 1970s to seriously flawed plans for large scale and highly destructive roadbuilding in urban areas. Criticisms of that approach have been well documented (see for example RTPI 1989), but the main problem was the obsession with meeting unrestrained demand for car use, and the almost total neglect of every other aspect of the transport problem (Thomson, 1969). The so-called "Land Use Transportation Study" was a technique born of the North American culture, and miscarried to Britain and other parts of Europe. Whilst many of the shortcomings of such studies are now recognised, a legacy of mistrust still surrounds the term "integrated land use-transport planning". The link between transport and land use at first sight may seem obvious, but there are at least three distinct levels on which the two need to be integrated, which are here termed "physical", "structural" and "operational" integration.

Physical integration

Buildings must be designed and located so that their users can come in and out, and to and from. The need for engineering and design to achieve a safe and efficient interface between individual buildings and the transport system should be self-evident.

Structural integration

The need for motorised travel will not be reduced if related activities are located further away from each other. Distances between homes, workplaces, shops, health, education and recreation facilities must be kept short so that journeys can be made on foot or by bicycle. To the extent that not everyone can live within a walk or cycle trip of all the places they want to reach, facilities must be arranged at "nodes" or along corridors of movement so that public transport can easily serve them. This "structural integration" of transport and site-based activities should be aimed at achieving "minimum travel". Because land use change and new development occurs relatively slowly, major results cannot be achieved in the short term. But equally, a long term satisfactory outcome requires proper decisions about incremental and piecemeal land use changes.

Perhaps more important, there is an urgent need to protect Britain's rich legacy of towns and cities that were laid out before the motor age, whose potential for supporting minimum travel lifestyles is being daily eroded by new roads and car parking and competition from car-based developments. This is an environmental threat which has not been fully acknowledged.

Operational integration

"Physical" and "structural" integration are valuable in themselves, but they tend to ignore the enormous variation in travel patterns that can occur without any change of land-use, or any change of transport infrastructure." People are continually changing the location of their various activities. For example, each year 10% of people change their home, and many people change their place of work. Frequent day-to-day choices are also made about where to shop, recreate, socialise etc. Indeed, activity choice is expanding as basic community facilities like schools and hospitals are seen as marketable commodities in competition with each other, rather than as serving local populations. There is also, of course, a continual turnover of people at every stage of the life cycle! Within a few years, therefore, it is possible for travel patterns (mode, direction, time and length distribution of journeys) to have completely changed without any change at all having been made to transport infrastructure, buildings, or even the uses to which buildings are put. Activity change is therefore just as important as land use change. To influence activity location it is necessary to integrate other aspects of public policy which affect people's decisions about how, when and where to travel. We refer to this as "operational integration". There are many strands of public policy involved, from vehicle and fuel taxes to road tolls and parking charges; and from housing allocation policy to school and hospital catchment areas. The main problem, however, is the direct and indirect subsidies to private motor transport (both lorries and cars) whereby most external costs are borne by society at large and not by the users. People therefore, both as individuals and as representatives of corporate bodies, make their location decisions and their travel decisions on the basis of travel costs that are artificially low. Thus while physical and structural integration can create the possibility for travel patterns that are less burdensome on society, these choices will not actually be made whilst other aspects of transport, taxation and public policy leave major distortions in the travel market.

CHANGING COURSE

Transport related problems result from a mismatch between what is desired, and what is available. The impression is often given that the only problem is congestion and a shortage of roadspace. But clean air, quiet surroundings, safety and security on the roads, freedom to walk and cycle, and access for everyone to good public transport are also in short supply, and shrinking fast. The answer to alleviating these shortages does not lie solely in the provision of more transport capacity, be it public or private, but in a balance between supply expansion and demand limitation.

By and large, people are not making more journeys, but they are making longer journeys, and they are making an ever increasing proportion of their journeys by car. Land use decisions are being made which are increasing the level of car dependence. New large stores, leisure facilities and businesses that are located away from established centres remove people's choice of transport mode. Those with cars have no choice but to use them. For everyone else, reaching such facilities becomes a near impossibility. As Illich

(1974) cogently stated, 'motorised vehicles can create new distances which they alone can shrink. They create them for all, but they can shrink them for only a few'.

Many journeys are made by car because of the poor quality or expensiveness of the alternatives. Perhaps the best example of such 'forced' car use is the journey to school (see Jones 1977, Rigby 1979). On the one hand, the proportion of children driven to school has risen as parents have become increasingly reluctant to let their children face the danger of crossing busy roads on foot and alone. This process is of course self-reinforcing, since as more people drive their children to school, so traffic levels around the school grow, increasing the level of danger for the rest. On the other hand, the creation of fewer, but larger schools means that for many children, walking to school is simply not an option, due to the distances involved.

The issue is therefore not how much access we need, but how much motorised mobility we can afford. A new policy framework within which location and development decisions are taken needs to be devised that will contribute to the objectives set out earlier in this book. This means setting a new course, and a reversal of the current trend towards land-use patterns and location choices which depend on the car and the lorry as the main mode of travel. A series of problems need to be addressed directly by this new policy direction.

Firstly, choices for non-car users are restricted, because they are forced either to use local facilities which are declining in number and quality, or to make long and arduous journeys by public transport, cycle or foot to the new facilities.

Secondly, the diversion of resources from established centres can result in the withdrawal of investment, planning neglect, poorer maintenance, the erosion of civic pride and the acceleration of decentralisation.

Thirdly, direct competition with established areas (eg out-of- centre retail developments with traditional centres) can cause economic and cultural decline.

Fourthly, fewer people using public transport or walking, heightens problems of personal security, and those reliant on public transport or their own two feet are often those who are most vulnerable to attack - for instance women, the elderly or members of ethnic minorities. The result is a further reduction in these people's freedom.

Fifthly, increasing use of cars and lorries results in more danger. The threat from high traffic levels means many children are not allowed to venture out alone, and elderly people are frightened to make trips on foot. Again the 'freedom' of car users erodes the freedom of those without.

Sixthly, development of a dispersed, car based society necessarily has severe implications for the environment. Longer distances by car are obviously less

energy efficient than short distances by foot, cycle or public transport. Similarly, extensive car use is producing serious air pollution problems. The catalytic convertor is no more than a palliative since reductions per vehicle will be overtaken by increases in vehicle use, and in any case it does nothing to reduce carbon dioxide. Most people in urban areas are also affected by problems of road noise and vibration. Finally, road building and the development it encourages often impinges on the natural or semi- natural environment.

The popular notion that mobility is good in itself must be challenged if solutions are to be found. Much play is made of the evils of congestion but congestion is no more than a symptom. The assumption that a system is satisfactory simply because it is congestion-free is erroneous. Congestion-free cities are not uncommon in the United States, yet these cities have failed to solve other aspects of the transport problem, and the levels of environmental damage are increasingly seen to be unsustainable. In the European context, present and predicted car mileage means major environmental destruction, yet car mileage per capita is less than half that of the United States, as shown in Table 1. Much lower car ownership is partly a result of positive choice because of the quantity of public transport (most clearly seen in London). Conversely, much car ownership in rural areas is forced upon people because of the lack of alternatives.

TABLE 1 CAR OWNERSHIP AND USE IN SELECTED WESTERN COUNTRIES, 1988

	CARS PER 1000 PEOPLE	CAR KILOMETRES PER CAPITA, PER ANNUM
UNITED KINGDOM	360	4865
FRANCE	394	5366
W. GERMANY	474	6152
ITALY	296	4024
NETHERLANDS	351	5270
SPAIN	282	1897
SWEDEN	416	6071
UNITED STATES	629	11169

Although many of the underlying conditions are different, experience in the United States does provide a useful lesson for the UK. Unterman (1990), provides an excellent chronology of the US plunge to car dependency. Before the Second World War, suburban development was generally designed to be used by pedestrians, with growth usually focussed around tram or train stops, often with small retail centres associated. However, after the war, returning GIs needed housing and employment. Munitions factories turned to car production, while the oil and construction industries boomed. The Government focussed this energy into suburban growth. Rising car ownership dictated the shape of these suburbs, and rarely did new streets include facilities for

pedestrians or cyclists. Planning became reactive - simply providing road infrastructure to meet demand. Local centres were replaced by commercial strips where buildings were separated by extensive car parks. As Unterman suggests, in many cases it was safer to cross the road by car than on foot! The planning system unquestioningly shifted to its new role - everything about suburban development was seen as positive, and no-one questioned the consequent environmental degradation, energy consumption, loss of community or pedestrian safety.

Britain is perhaps half or two thirds of the way towards car saturation. But the choice we need is not between cars and more cars, but between cars and other less destructive means of getting about

In seeking new solutions to transport problems, two major opportunities should be recognised and exploited.

Firstly, like the rest of Europe, but not the USA, over three quarters of the population lives in urban areas which were substantially laid out before the mass motor age. We know, therefore, that we could (if necessary) survive without the car. Adjustments in lifestyle would undoubtedly be painful for some, but blissful for others. Retention of these older urban structures means that much unnecessary traffic can be avoided. Industrial restructuring over 50-80 years, however, would make it more difficult to manage without the lorry.

The second opportunity lies in the fact that car ownership is currently lower in Britain than in many other European countries. This is usually presented as an indicator of the backwardness of Britain, yet this is only because we orientate our judgments around the fortunes of the motor industry rather than with broader visions of the quality of life.

The policies advocated below exploit these opportunities by conserving and regenerating the urban fabric, and by promoting a new faith in the city, and by improving the quality of alternatives so that people actually choose less car travel.

SUGGESTED POLICIES

The final section of this chapter attempts to outline a set of policies which the authors believe are workable and capable of bringing major improvements.

1. Patterns of land use and urban form which enable accessibility for all should be conserved and maintained as an important national asset. This could be achieved through strategic and local planning machinery, backed by national transport and land use policy. The Dutch "Compact City" policy could be explored as a model. Research (for example Edwards 1977, Newman and Kenworthy 1980, 1988, 1989) indicates that compact cities have significantly lower energy consumption. An immediate consequence would be a presumption against out-of-centre developments.

2. New urban development should be based on a hierarchy of transport modes and economic functions. Thus daily needs should be able to be met within walking distance, whilst employment and more specialised services should be located within reasonable cycling distance, or at a location where bus or train routes are focussed. An example of such a system is the Dutch new town of Almere, near Amsterdam. Neighbourhoods are focussed around infant schools and local shopping and health facilities, and provided with excellent pedestrian routes to allow access. Larger shopping centres, schools and employment areas are within reach of a dense network of cycle tracks, and also of a segregated system of bus routes, which stop no more than 400 m from any home. Finally, bus and cycle routes give access to railway stations, and thus to Amsterdam. In this example, cars are restricted to a small number of roads, and often access houses from the rear, the normal 'street' being for pedestrians and cyclists only. In Toronto (Nowlan et al, 1990), the introduction of more housing in the central area has already helped reduce in-commuting. In Portland, Oregon (Newman and Kenworthy, 1989), the local authority has reoriented its policies, away from cars and towards public transport - replacing a proposed freeway with a light rail system. The city aims to focus urban growth within the light rail corridor, with the potential to save energy, reduce car ownership and use, and reduce environmental pollution. A similar policy has been adopted in Greater Vancouver, where high density development is now focussed at stations along the city's new light rail system. Other cities (e.g. Vienna and Copenhagen) apply similar principles to expansion at the edge of existing settlements (TEST 1988).
3. Access involving minimum distances can also be achieved by sensitively increasing the density of urban development and by mixing land- uses. Single use office developments are more likely to generate car trips than mixed developments which include shops, restaurants, health or leisure facilities. Large areas of housing will similarly generate more trips than areas where employment, shopping and education are integrated. Cervero (1988) cites a study carried out by the US Institute of Transportation Engineers which found that mixed land use developments in Denver reduced trip generation rates by as much as 25%.
4. Large office and commercial development and other major generators of passenger trips should be permitted only at focal points of the public transport system. Location at individual stations or bus stops in suburban areas will not succeed in reducing the proportion of access by car. Car parking must be strictly limited if car dependency is to be avoided. This limitation will further encourage developers, and people who are moving, to favour locations with good access by "town friendly" modes.

5. Distribution depots and other land uses that generate large volumes of heavy goods traffic and relatively little passenger traffic should be located for convenient access to the major road network and, where possible to freight rail or water depots.
6. Strategic plans should identify a hierarchy of employment and service centres, together with a strategy for them to function without the car. Non-residential development outside these centres (such as out of town superstores) should not be permitted, with clear national and regional government backing for such decisions.
7. Transport issues should be fully integrated within the planning system. The detachment of the planning system from transport issues is well illustrated by a recent RTPI report (1991) which states that "development control tends to focus on highway rather than transport matters. An application tends to be assessed in terms of its effects on a local road network in the short term, rather than on the urban form in the longer term". Transport should be neither an add-on extra, nor an end in itself. The scope of Development Plans should be widened to comprehensively cover transport issues. This would require an overhaul of the planning system. The scope of Development Plans should be widened to include non land-use policy such as public transport fare levels, parking charges and controls and road and traffic regulations. The objectives of Development Plans should include the reduction of traffic and car dependence. Traffic management and traffic calming schemes should come within the meaning of the term "development". This would have the twin advantage of encouraging town planners to take a more active interest in traffic and transport issues, and bringing such locally important issues into the statutory consultation machinery currently enjoyed only by land use proposals.
8. An "accessibility audit" should be undertaken of all developments involving a change in the use of land. This should pay particular attention to the needs of those with a physical handicap, women, children, the elderly and others traditionally left out of transport planning. Inaccessibility by certain groups of users should be a ground for refusal of planning consent.
9. New transport and land-use developments should also be the subject of an environmental audit, and refused where agreed pollution limits would be exceeded as in Switzerland.
10. Strategic planning authorities should have overall control over the pattern, quality, frequency and price of urban public transport services, and be responsible for their integration and marketing. The private sector should continue to be involved in the provision of services, but according to specified levels. The value of competition between operators should be exploited, but only off-road through the contract tendering process.

11. All transport tax, investment, subsidies and transfer payments should be reviewed and amended to encourage environmentally and socially benign modes of travel, and to penalise other modes in relation to the damage they cause. The outcome of such a review will include removal of company car subsidies, including subsidised parking, and taxation of vehicles graduated according to the damage they cause. A "Green" tax such as discussed in other chapters, form an alternative to legislation. Revenue from road user charges (as opposed to general motor taxes) should be used to finance public transport improvements, including fare subsidies if appropriate.
12. Incentives for rail freight (e.g. tax exemption on industrial sites linked to rail) and break- bulk depots should be increased.
13. Research is required into homeworking and other potential means of reducing physical travel using electronic communications. Views of the effectiveness of new technology as a means of reducing people's need to travel are, however, mixed. While being able to work from home, or from a small local base, may reduce people's need to travel to work, the freedom to live where they want means that many people may relocate to inaccessible rural locations where a significant amount of travel is required for other activities such as shopping, education or entertainment, and where public transport is relatively poor. Salamar (1985) concluded that the net effect of telecommunications on travel would be minimal.
14. There should be heavy investment in the quality of public transport, coupled with dis-incentives to use private transport. The priority should be the improvement of intra-rather than inter-urban public transport.
15. There should be a substantial shift of expenditure priorities away from provision of road capacity to investment in alternative methods of travel, and away from inter-urban to urban transport.
16. Policies to limit traffic should be aimed first of all at regular longer-distance car trips, and car commuting trips to inner and central city locations. (Removal of company car subsidies for example would be in line with this policy.) The least damaging category of car trip might be the occasional short journey for which no reasonable alternative is possible.
17. Interchanges, vehicles and other transport facilities should be developed as a means of encouraging multi-modal transport. Ensuring that all trains carry bicycles, and new park and ride facilities are examples. Combined transport should be promoted with environmental objectives for both freight and passenger journeys.
18. Higher car purchase tax and/or other disincentives to multiple car ownership are required. Taxation should also be designed to discriminate against vehicles which create more danger and more

environmental damage. Alternative types of access to cars that offer the potential to reduce car ownership, including short term local car rental, should be the subject of research and experimentation.

19. A major investment programme to implement traffic calming measures should be undertaken. The target should be to achieve a self-enforcing 20 mph speed limit on all streets except main through routes in built-up areas by the end of the century. Consideration should be given to ways of funding traffic calming measures through contributions from owners of frontage property likely to benefit, and private sector sponsorship schemes. This is seen as a way of improving civic consciousness, as well as increasing the pace of implementation.
20. The general non-urban speed limit should be reduced from 70 to 55 mph, and enforced using electronic surveillance. Automatic speed governing of vehicles (now the subject of active experimentation in Germany) should also be studied as a medium to long term possibility. The purpose is to reduce casualties, energy consumption and pollution, and to improve the competitive position of rail.
21. Comprehensive controls over parking provision and enforcement are required. National parking standards should be set for both residential and private non-residential parking provision. These should be integrated with plans for public transport improvements and proposals relating to the other land use policies in order to reduce to a minimum the overall requirement. Incentives and taxation should be designed to reduce current over-provision, especially at office and commercial locations.

Finally, the policies outlined above should be accompanied, as far as possible, by targets so that the effectiveness of the policies can be monitored and evaluated. Such targets will need to be related to the specific objectives outlined in the early part of this book. An equally important element will be information. The successful adoption of a green transport policy for Britain depends on there being a clear explanation of the policies and why they are being adopted, and subsequently, what their benefits have been

References

- Cervero, Robert (1988) **Land Use Mixing and Suburban Mobility** in *Transportation Quarterly* 42/3 July pp429-446
- Edwards, JL (1977) **Use of a Lowry-type Spatial Allocation Model in an Urban Transportation Energy Study** in *Transportation Research* 11/2 pp117-126
- Jones, TSM (1977) **Young Children and Their School Journey** TRRL Supplementary Report 342
- Greater Vancouver Regional District (1990) **Creating Our Future: Steps To A More Liveable Region** Vancouver GVRD

- Hillman, Mayer, Irene Henderson and Anne Whalley (1976) **Transport Realities and Planning Policy** London Political and Economic Planning
- Illich, I (1974) **Energy and Equity** London Calder and Boyars
- Jacobs, J (1961) **The Life and Death of American Cities** London Pelican
- Nowlan, David M and Greg Stewart (1990) **The Effect of Downtown Population Growth on Commuting Trips - Some Recent Toronto Experience** Paper prepared for JAPA
- Pharoah, T M (1991) **Transport: I-low Much Can London Take?** in Hoggart, K and Green, D **London: A New Metropolitan Geography** London Edward Arnold
- Plowden, SPC (1983) **Transport efficiency and the urban environment: is there a conflict?** in *Transport Reviews* Vol 3 No 4 pp363-398
- Newman P and J Kenworthy (1980) **Public and Private Transport in Australian Cities. The Potential for Energy Conservation Through Land Use Change** in *Transport Policy and Decision Making* 1(2/3) pp149-167
- (1988) **Transport Energy Trade-off: Fuel Efficient traffic Versus Fuel Efficient Cities** in *Transportation Research* Vol 22 No 3 pp163-174
- (1989) **Cities and Automobile Dependence: An International Sourcebook** Gower
- OECD Road Research Group (1977) **Transport Requirements for Urban Communities: Planning for Urban Travel** Paris OECD
- Rigby, JP (1979) **A Review of Research on School Travel Patterns and Problems** DoE/DTp TRRL SR460
- Royal Town Planning Institute (RTPI) (1989) **Transport Planning in a New Era** London RTPI
- (1991) **Transport, Growth and Planning Policy** London RTPI
- Salamon, I (1985) **Telecommunications and Travel. Substitution, or Modified Mobility?** in *Journal of Transport Economics and Planning* Policy 19/3 pp215-235
- SEEDS (South East Economic Development Strategy) (1990) **Wheels of Fortune: Strategies for Transport Integration in the South East of England** SEEDS
- Second Chamber of the States (Netherland Government) (1990) **Second Transport Structure Plan: Transport in a Sustainable Society. Part D: Government Decision** Netherlands Government
- TEST (Transport and Environment Studies) (1988) **Quality Streets: how traditional urban centres benefit from traffic-calming** London TEST
- Thomson, JM (1969) **Motorways in London** London, Duckworth
- Unterman, Rich (1990) **Improving the pedestrian Environment in the USA,** in Tolley, Rodney (ed) **The Greening of Urban Transport : Planning for Walking and Cycling in Western Cities** London Bellhaven Press