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Integrated Public Transport Corridors

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Context

This paper is concerned with the relationship between land use development and accessibility by public transport and non-motorised modes of travel. It reviews concepts and practice and offers some conclusions on how future development can be planned to encourage greater use of non-car modes, and discourage use of the car.

Policy context

PPG13 (Transport) in 1994 advised that new development should be located so that it is accessible by public transport, walking and cycling, as well as by car. The Transport White Paper of 1998 included a reference to research into the promotion of development in "public transport corridors". This sparked a great deal of interest by interest groups, including the CPRE and FOE, who commissioned their own research. The RICS also commissioned research into what they initially called "Transport Development Zones". A transport select committee report reviewing the White Paper said that the corridors policy was the one aspect they disagreed with. Meantime the DETR had commissioned the promised research into corridor development.

The policy issues

For the DETR, the issues are fairly wide as to how development can be focused at locations that are well served by public transport (and other modes). The concern is with implementing the policies advocated in PPG13. New free-standing settlements are only part of this, but are of concern because of the implications for Green Belts and other protected countryside.

The CPRE/FOE are concerned in particular with the new settlement issue. But they recognise that more intensive development in urban areas has a bearing on the pressure for development in the countryside.

The TCPA is also a player in this field, with a fairly strong advocacy of new settlements, which they see as essential for accommodating predicted new housing, and of locating them in public transport corridors. The clearest exposition of their position is perhaps found in Sir Peter Hall's "Sociable Cities" (Wiley 1998). This advocates many new settlements like beads on a string along existing and new rail lines in south east England.

The RICS study of more intensive development at stations is more limited in scope, and seems to acknowledge that the main issues arise at major stations in the big cities. Elsewhere, land and property values will rarely be sufficient to fund major public transport improvements.

Precedents of planning in relation to public transport

Before 1950, all development had to be accessible by on foot, by bicycle, and by public transport – these were the only modes available to most people. Therefore most pre-1950 development and the structures that were produced (routes, networks, densities, mix of land use etc.) provide examples of public transport-oriented development.

Since the 1950s-1960s new development has instead been oriented to private motorised road transport, both personal transport and freight transport. This has produced urban structures that are difficult and sometimes impossible to serve by public transport. Walking and cycling has also become difficult due to greater distances and conditions that are at best unpleasant and at worst downright dangerous.

Efforts are now being made to reverse this trend. The biggest efforts, ironically, seem to be made in those places where the process is most difficult to reverse, such as cities in north America and Australia. Perhaps they are able to see the problem with stark clarity, whereas we have barely noticed the incremental slide towards car-dependent urban change.

In Canada and the USA, efforts are now being made to consciously plan what is termed "Transit Oriented Development" (TOD). Such efforts are prominent, for example, in parts of California, in Portland, Oregon, and in Ottawa, Toronto and Vancouver.

Going back in time, there were plans drawn up in the 1960s for transit oriented development in a number of cities, on both sides of the Atlantic. Perhaps the most famous of these were the

- Copenhagen “finger plan”, where expansion was planned along five radial corridors served by a new suburban rail system;
- Stockholm “self contained” suburban satellites based on the “Tunnelbana” system;
- Washington “star plan”, like Copenhagen based on expanding along rail corridors radiating out from the city centre.

In common with all of these major strategic planning efforts was predicted large-scale population growth and the need to accommodate this in new settlements.

Although apparently transit-oriented plans, all the cities mentioned in fact saw the role of rail as very limited, namely commuting to work in the city centre from suburban areas. It was never envisaged that other categories of trip (shopping, leisure, social, business etc.) would rely on rail. To cater for these other trips, large motorways have been built, mostly around the cities rather than to them. These orbital or tangential motorways have sparked off major development of housing, retail, industrial and commercial uses that are unrelated to rail transport, and which have fuelled a massive increase in car use and car dependency, and of course truck dependency.

DETR research

The research project for the DETR involved a review of the concepts of corridor and public transport-oriented development, and exploration of the issues of implementing such development through a number of case studies.

Some important conclusions from this work are summarised below.

Meeting the new policy agenda

1. There is scope for closer and more pro-active integration of the transport and land use elements. The Transport Act 2000 and Local Transport Plans are widely anticipated to offer more scope for such integration.

2. Quality bus contracts and partnerships are expected to strengthen the ability of planning authorities to guarantee delivery of public transport services that are coordinated with new development.

Promoting the benefits of sustainable access

1. Public transport orientated schemes can prove cheaper for developers in the long run, with lower contributions to transport and more intensive use of land

2. PTOD can provide a higher quality environment, less dominated by roads, parking and traffic. This environment premium can be reflected in property and land values.

3. Community benefits can also be emphasised because development that is accessible by a choice of travel modes promotes social inclusion. This in turn contributes to the creation of vibrant and diverse neighbourhoods.

4. There is scope for more effective marketing and promotion of public transport in new developments.

Aiming for certainty

5. Where there is certainty, as in a development brief, or of a firm commitment to high quality public transport, it is easier to get the support of developers.

6. The provision of public transport often requires “gap funding” to ensure that services are available on day one for early occupants. This can often be funded through S106 agreements.

Applying the new policy agenda

7. Development briefs and master plans should address the issue of accessibility at three levels

    a) Location and accessibility by all modes

    b) Site layout and design to promote sustainable access

c) Detailed design to enhance access quality

8. Influencing public transport use through land use development is often referred to as a long term policy, but ***action is needed straight away*** to ensure that the necessary outputs are achieved with each new development.

The importance of complementary actions

9. PTOD depends to some degree on measures to control or limit development ***outside*** the public transport catchment areas. This is one of the most significant aspects of promoting sustainable access.

10. The physical arrangement of urban development and public transport infrastructure provides a necessary but not sufficient condition for increasing the role of public transport. Other factors (such as the relative price of public and private transport, including parking) will have a major influence on actual travel choices and behaviour.

11. While public transport access is important, walking is more prominent in the outcome mode split. To this must be added the walking that is undertaken as part of public transport trips.

Leading by design

12. Local authorities should be pro-active and not just rely on individual private sector development proposals.

13. Re-orientating development towards public transport involves consideration of bus and rail facilities as integral to urban structure and development, rather than simply as a transport matter.

14. There is a clear need for a much more pro-active role to be taken by local authorities in setting out their requirements and aspirations for PTOD. Of particular benefit will be development briefs or master plans for the areas contained within the walking catchment of important public transport locations particular sites. Such framework documents will carry particular weight and have best effect if they:

    a) Are given Supplementary Planning Guidance status

    b) Are consistent with Development Plan policies

    c) Are integrated with the Local Transport Plan

d) Provide clear guidance on the likely level and nature of private sector funding contributions that will be sought (see below).

Bringing stakeholders together

15. Negotiations between developers, local authorities and public transport providers can be difficult, protracted, and prone to weakness in the decisions reached. It is therefore important that policies are clear, consistent and fully supported at all levels of government, including following planning appeals.

16. PTOD development is not simply a matter for local authorities. Central and regional government has a major role to play. As concluded in earlier DETR and Scottish Office research, the establishment of a national upper limit on parking provision, as included in the draft revision of PPG13, is particularly important.

Securing appropriate developer contributions

17. Developers may be willing to accept obligations that include financial or other contributions towards public transport improvements.

18. Of particular importance is the need to secure public transport ***services*** as opposed to infrastructure.

Assessing the case for new settlements

19. Sustainable access criteria provide no independent support for free-standing settlements, compared to other forms of development.

20. Amongst the local authorities studied, only general arguments have been reported in favour of new free-standing settlements. New settlements should, as set out in PPG3, be the last tier in the sequential approach to new housing where the need for such growth has been established. Issues include:

    a) the relatively small size of proposed new settlements, and their consequent lack of self-containment;

    b) the need to address all trips, not just the journey to work; and

    c) the likely transport outcomes as determined by layout, design, public transport supply, and parking.

    Good public transport access is a necessary but not a sufficient condition to justify the creation of new free-standing settlements.

Further reading (not fully up to date)
In 2 parts:
Land use planning and Transport planning

1. Land use planning

Historical development of public transport corridors (urban geography etc)

Black, A, 1990, "Analysis of Census Data on Walking to Work and Working at Home", in Transportation Quarterly, v44 No1, pp 107-120. *Suggests high density and mixed development in order to increase travel on foot.*

Daniels, PW "Office Location and the Journey to Work" *A comparative study of five urban areas concentrating on office land use. Looks at the residential locational behaviour, and the journey to work, of office staff from several offices in 5 decentralised locations.*

*Daniels, PW and Warnes, AM (1980) "Movement In Cities. Spatial Perspectives on Urban Transport and Travel" Methuen London. *This book describes various aspects of urban travel (i.e. distance, mode, and frequency). It draws material from various surveys of British towns, with occasional reference to the USA and Australia. Gives an extensive bibliography.*

Das, Mira (1978) "Travel to Work In Britain; A Selective Review" TRRL Laboratory Report 849 Berkshire England. *Reviews research on modal split, modal choice, journey length and time, spatial distribution of residences and workplaces, and broad patterns of movement in urban areas. The information is supplemented with 1975/76 travel survey data, and findings are discussed.*

Davidson, KB (1978) Use of Accessibility in Metropolitan Strategic Planning "The 9th Australian Road Research Board Conference Proceedings" Part 6 Transport Planning and Evaluation Brisbane Australia. *The conceptual and experimental development of a relationship between accessibility and density, together with utility measures that can be derived from it.*

De La Barra, Tomas (1989) "Integrated Land-use and Transport Modelling Decision Chains and Hierarchies" Cambridge University Press Britain. *Looks at Van Thunen, Christaller, Lösch, Wingo, and Alonso models of land use, then looks at spatial interaction models, and compares these with the traditional models.*

*ECMT, 1995, "Urban travel and sustainable development", OECD/ECMT Paris. *Includes chapters on policy levers, land use, and transport.*

Keyes, DL (1982) "Energy. for Travel: The Influence of Urban Development Patterns" in Transportation Research 16A (1) pp65-70. *New growth needs to be located to reduce travel and conserve energy. 49 US metropolitan areas were tested and results suggest that medium size cities with clustered residential densities are associated with lower per capita petrol consumption.*

King, RJ (1990) "Urban Housing Market Change as a Context for Transport Change: Some Approaches to Analysis" in Transport Reviews v10 n1. *Explores residential location decisions as a context for transport and communications change. Policy implications are developed, including those for reducing travel.*

"Metroland: 1932 edition", reproduced 1987 with introduction by Green, O; Oldcastle books, Harpenden. *Illustrates how the Metropolitan Railway and associated land development company marketed development around their stations.*

*Parsons Brinckerhoff Quade & Douglas Inc, 1995, "Transit and urban form: a synthesis of knowledge", For Transportation Research Board, TCRP project H-1. *Review of the subject with references, but strong USA focus*

*Thomson, J.M. "Great cities and their traffic", Gollancz, 1977. *Examines land use and transport relationships in 30 cities worldwide, and classifies them according to "archetypes". Of particular relevance is the discussion regarding the importance of radial public transport compared to orbital, and the relationship between the strength of the city cenmtre relative to the suburban areas. Hence the classificatioon of archetypes in terms of "Strong centre" cities like Paris, and " Weak centre" cities like Copenhagen and Chicago.*

Development at stations

*Collins, M and Pharoah, T "Transport organisation in a great city: the case of London", Allen & Unwin, London, 1974. *Explores the link between government structure and transport policy in the 1960s and early 1970s. 13 major case studies in London including:*

- ***Thamesmead**: poor relationships between housing and employment, poor transport links, social isolation; and*
- ***development at stations**: Highlights the lack of any planning strategy to exploit benefits, or to promote schemes.*

*London Borough of Hillingdon (1989), "Traffic generation study: high tech. estates and office buildings", TRICS report 89/1. *Mode split surveys at offices in west London revealed that the non-car share of travel by employees was minimal (10% or less) even at offices located adjacent to an Underground station. Car use was almost as high amongst visitors. The cases studied had off-street parking sufficient for all users.*

The 4.4 million houses by 2016 debate, public transport corridors in existing settlements and the relationship between land use planning and transport

Re-structuring urban form, compaction, densification, intensification, town cramming etc. Compact city, town versus city, town cramming, rural protection, green belt, sustainability debate around urban form and structure. Also social aspects: exclusion, crime etc.

Abbas, K. , Okail, O. & Mabrouk, I. "A trio management package for relieving traffic congestion in Cairo: traffic, travel demand and land-use management" in Policy, Planning and Sustainability: Seminar C (P413), European Transport Forum, (PTRC) September 1997 pp323-346.

*Apel, D, Lehmbrock, M, Pharoah, T and Thiemann-Linden, J (1997), "Kompakt, mobil, urban: Stadentwicklungskonzepte zur Verkehrsvermeidung im internationalen Vergleich", Deutches Institut für Urbanistik, for German Environment Agency (Umweltbundesamt), Berlin. *Chapters in English on planning in Portland (Oregon) which includes discussion of the MAX light rail and its development impact, and Oxfordshire*

(England). The latter provides evidence that the structure plan growth-pole strategy is less able to deliver reduced travel and car dependence than peripheral extensions to Oxford city. German chapters include measures for focusing development around public transport and achieving mixed use and high density development. This argues for and strengthening of non-radial public transport and stronger sub-centres.

Barber, DK (1992) "Demographic Factors, Metropolitan Growth, and Trip Generation" Transportation Research Board Unpublished Report n30 p20-23 USA. *The possibility of compact higher density living is found in examination of demographic, public policy and economic factors.*

*Bendixson, T (1977) ed 2 "Instead of Cars" Pelican. *In chapter 3 'There Will Always be a Neighbourhood' Bendixson argues the case for '...the opening of shops amongst and within houses...', and similar human scale development, instead of regional developments.*

Betz, Mathew J (1979) "Land-Use Density, Pattern, and Scale as Factors in Urban Transportation" in Traffic Quarterly 32 (April 1973) p263-72.

Black, Alan (1990) "Analysis of Census Data on Walking to Work and Working at Home" in Transportation Quarterly v44 No. 1 Jan 1990 p107-20. *The author uses census data to examine hypotheses concerned with walking to work, working at home, and their relationships to density, land use mix and proximity, socio-economic variables, and climate. He suggests that high-density development, and mixed land use planning, are sensible options to encourage walking.*

Bland, BH (1983) "Land-use Patterns and Travel" TRRL Laboratory Report LR 1(82) Berkshire England. *The 'LUTE' model is tested on a number of hypothetical towns. The model supports that car-ownership is lower where congestion and parking difficulties, or good access by public transport or on foot, make car ownership less worthwhile. Walking is an important mode. Neither public transport subsidies nor higher densities seem to* ***be*** *effective methods of reducing car ownership or use. The suggestion that travel can be reduced by moving homes and jobs closer is not supported by the model.*

*Blowers, A, (ed) "Planning for a Sustainable Environment", a report by the Town & Country Planning Association, Earthscan, London 1993. *TCPA book with articles by David Hall on the planning context; Holliday on ecosystems, Adrian Webb and Chris Gossop on energy policy, Blowers on pollution and waste, Vale on building energy issues, Webb and Gossop again on TRANSPORT, Clark and others on a sustainable economy, Breheny on the sustainable city region; and Rookwood on implementation.*

Blunden, WR (1971) "The Land-use/Transport System. Analysis and Synthesis" Pergamon Oxford. *Basic concepts and problems of land-use and transport interaction.*

Borukhov, E and Hochman, 0 (1977) "Optimum and Market Equilibrium in a Model of a City without a Predetermined Centre" in Environment and Planning A v9 n8 p849-56 London. *In this model, individuals choose locations that minimise their transportation and housing expenditures. Results are obtained for a social optimisation and a competitive equilibrium. In both cases there is a centre where land values and density are*

higher, but the social optimum city is more dense owing to externalities which are not taken into account in the competitive city.

Breheny, M, (ed) "Sustainable Development and Urban Form", European Research in Regional Science 2, Pion Ltd, London, 1992.

Breheny, M et al " The compact city and transport energy consumption", Transactions of the Institute of British Geographers 20(2) 81-101, 1995.

Bristow, A., May, A. & Shepherd, S. "Towards the sustainable city: the impact of land use - transport interactions" in Policy, Planning and Sustainability: Seminar C (P413), European Transport Forum, (PTRC) September 1997 pp149-160.

Cervero, R. 1988, "Land use mixing and suburban mobility", *Transportation Quarterly,* Vol 42, No. 3, pp.429-446.

Cervero, Robert (1989) "America's Suburban Centres - The Land Use Transportation Link" Unwin Hyman London. *The problems of suburban office growth and congestion are studied for 'SEC' groups, and 3 case studies. Suggestions are given for solutions to these problems. Extensive bibliography is given.*

Cervero, R, "Congestion relief: the land use alternative", Journal of Planning and Education Research, vol 10, pp 119-129, 1991.

Cervero, R, "Land Uses and Travel at Suburban Activity Centres" in Transportation Quarterly, Vol 43 No3 October 1991. *Examines influence of density, land use mix and parking facilities on travel demand, (USA context).*

Cheung, F. & Hoen, A. "Relationships between transport and land use in the Netherlands" in Transport Policy and its Implementation, Seminar B, (P402), PTRC Summer Annual Meeting, September 1996 pp51-63.

Dasgupta M (1993) "Review of transport and land use interactions"

De Cani, R. "Regenerating urban centres through integrated land use and transport planning policies - lessons from the USA" in Policy, Planning and Sustainability: Seminar C (P413), European Transport Forum, (PTRC) September 1997 pp251-262.

*Departments of Environment and Transport, "Reducing Transport Emissions through Planning", report by ECOTEC and TPA, HMSO, 1993. *Tentative conclusions about settlement size and density in relation to travel demand. Attempts to examine these factors as determinants of present behaviour, rather than of potential behaviour. (Note: Fairly severe criticisms have been levelled at this report and its findings.)*

Department of the Environment, "Alternative Development Patterns: New Settlements", report by David Lock, HMSO, 1994.

*Departments of Environment and Transport, "Planning Policy Guidance: Transport" (PPG13), March 1994.

Departments of Environment and Transport, undated (1995), PPG13: a guide to better practice", London, HMSO. *Section 2 covers strategic and local urban structuring around public transport.*

Dugdill, Gerald "PPG1 : setting a framework" in Urban Environment Today, n2, 8th August 1996 pp9. *Draft planning guidance on general policy and principles, PPG1, aims to provide a strategic commentary on planning policy. It refers to the need for sustainable land-use and transport planning, encouraging town centres and mixed uses. It also specifically addresses the needs of disabled people.*

Dunn, James A Jr. (1981) "Miles to Gaz European and American Transportation Policies" p87-90 The Massachusetts Institute of Technology London. *Briefly notes that land use strategy in the USA is '...close to the nub of the problem'. Argues the case for high density and public transport verses low density and the car.*

Echenique M, Moilanen P, Lautso K & Lahelma H "Testing integrated transport and land-use models in the Helsinki Metropolitan Area" in Traffic Engineering & Control, v36, n1, January 1995 pp20-23. *During a strategic research project launched by Finland's National Road Administration the computer model MERPLAN was used to forecast the impact of planning decisions upon land use and transport.*

*Elkin, T; McLaren, D; Hillman, M, "Reviving the city", FOE 1991.

Engwight, David, (1993) "Eco City", John Carpenter Publishing, 33 Newton Road, Oxford.. *Argues that car (and traffic) reduces public space as social space and leads to social alienation and crime. Quotes Appleyard San Francisco study. Reviewed Guardian 5/11/93, which quotes Bertrand le Gendre (french urbanist) "Violence in towns is first of all the violence that has been done to towns themselves".*

Gurney, A. , Jenkins, A. & Smyth, A. "PPG 13: a vehicle for promoting the new agenda for a sustainable transport and land use policy" in Policy, Planning and Sustainability: Seminar B (P421), European Transport Conference, (PTRC & AET) September 1998 pp31-52.

*Hall, P and Ward, C "Sociable cities, the legacy of Ebenezer Howard", Wiley, Chichester, 1998. *Includes specific proposals for three regional polycentric cities in the South East based on existing or revived rail corridors. The book elaborates the Town & Country Planning Association view on how the projected new housing should be accommodated, arguing that at least 50% will have to be greenfield development, but that this can be sustainably provided by clustering small new settlements around rail stations to form polycentric cities. The discussion of functions and transport patterns generated by such development is weak.*

Headicar, P and Curtis, C (1996) "The location of new residential development: its influence on car-based travel", Oxford Planning Monograph ½, Oxford Brookes University.

*Hillman, M, Henderson, I and Whalley, A (1976) "Transport Realities and Planning Policy" Policy Studies Institute London. *An in depth study of the travel patterns of a variety of social groups, leading to recommendations for: proper regard to be given to all groups in the population and the travel methods they use. '...adequate consideration should be extended to the local nature of much daily activity and to the relevance of proximity and non-motorised travel.'*

*James N, Pharoah T, “The traffic generation game” in “Travel Sickness”, Eds Roberts, Cleary, Hamilton and Hanna, Foreword by John Prescott, Lawrence & Wishart, London 1992. *Deals with land use planning and location choice.*

*Jenks, M et al (eds) 1996, “The compact city”, E&FN Spon, London. *Articles both for and against compact city, though the arguments against are often polemical and from an Australian perspective. Draws the conclusion that “decentralised concentration” is the most efficient in reducing car travel.*

Jones, P. & Walker, H. “Civilising cities: the contribution of transport and land use policies” in Policy, Planning and Sustainability: Seminar B (P421), European Transport Conference, (PTRC & AET) September 1998 pp181-192.

Llewelyn-Davies, “Providing more homes in urban areas”, Joseph Rowntree foundation, York, 1994.

Llewelyn-Davies “Sustainable Residential Quality”, London Planning Advisory Committee, 1998.

Metro Monitoring and Development Study (TRRL et al), “The Metro Report: The impact of Metro and public transport integration in Tyne and Wear”, undated (1985?)

*Newman, P and Kenworthy, J, “Cities and Automobile Dependence”, Gower, 1989. *Major work of comparison of urban densities and energy consumption in cities around the world. It observes a strong inverse relationship between population density and per capita energy consumption, and offers a commentary of the development and transport structures that support high density. (Much of the data has since been updated and is due for republication.)*

*Newman, P and Kenworthy, J, Lyons, T, “Transport Energy Conservation: Policies for Australian cities” (strategies for reducing automobile dependence), Murdoch University, Perth, 1990.

*Newman P, Kenworthy J, and Vintila P, “Housing, Transport and Urban Form”, Background Paper 15 of the National Housing Strategy, Australian Government Publishing Service, Canberra, 1992. *Discusses land use and transport patterns in Australian cities using census data for these cities, and comparisons with data from 32 other cities world-wide. Future strategies for less car dependence are put forward, and implementation issues are discussed.*

*Organisation for Economic Co-operation and Development, “Urban travel and sustainable development”, Paris, 1995.

Owens, S., "Energy, Planning and Urban Form", Pion, London, 1986.

Owens, S and Cope, D, "Land use planning policy and climate change", UK Centre for Economic and Environmental Development, 1991.

Owens, S, “ Negotiated environments: needs, demands and values in the age of sustainable development”, in Environment and Planning A, 29(4) 571-580.

Pearce, D, “Blueprint 3; measuring sustainable development”, London, Earthscan, 1993.

Pharoah, T “Case study of Oxford, city and county” in Apel, D *et al* 1997 (see above).

*Pharoah, T and Apel, D, 1995, "Transport Concepts in European Cities", Avebury, Aldershot. *Includes case studies of 10 European cities. Two in particular discuss public transport corridors as a focus for growth (e.g. Amsterdam and Stockholm).*
The Karlsruhe case study describes in detail the pioneering project to break down divisions between regional rail, suburban rail, light rail and streetcar transport technology. The same vehicles running through Karlsruhe's main shopping street also on another part of their route share tracks with regional express and freight trains. The opening up of this technology creates wholly new options for urban public transport operation. It concludes that even cities with a strong track record of investment in and support for public transport (Amsterdam, Basle , Freiburg, Zürich) have not succeeded in reducing overall traffic levels, though levels have been stabilised in city core areas.

Planning and Transport Research and Computation (PTRC) (1993) "Developments in European Land Use and Transport" (Proceedings of Seminar E of 21st Summer Annual Meeting, 13-17th September 1993, University of Manchester, Institute of Science and Technology) PTRC SAM Seminar P367.

Ploeger J, Baanders A "Land use and transport planning in The Netherlands" in Planning for Sustainability, Seminar B, (P389), PTRC Summer Annual Meeting, September 1995 pp97-108.

Royal Institution of Chartered Surveyors (1996) "Shaping Britain for the 21st Century: Land Use & Transport - The Way Forward"

Salter, M., Saito, H. & Llorens, L "Tokyo - modelling the impact of transport on development" in Transport Policy and its Implementation, Seminar B, (P402), PTRC Summer Annual Meeting, September 1996 pp39-50.

*Sherlock H, "Cities are Good for Us", Paladin, 1991. *Final chapter discusses densities of residential areas (new and old). Argues for high density, mixed activity, human scale, architecture, urban structure and transport.*

Simmonds, D. & Coombe, D. "Transport effects of urban land-use change" in Traffic Engineering & Control, v38, n12, December 1997 pp660-665. *The objectives of this study were to investigate ways in which alternative ideas for more compact cities might affect both the total demand for urban transport and the costs.*

Stenstadvold M "Institutional constraints to environmentally sound integrated land-use and transport policies" in Planning for Sustainability, Seminar B, (P389), PTRC Summer Annual Meeting, September 1995 pp109-119.

Still, B. "The importance of transport impacts on land use in strategic planning" in Traffic Engineering & Control, v37, n10, October 1996 pp564-571. *This paper examines current practice in the assessment of traffic impacts on land use. Comparative research was undertaken in the U.S. where recent environmental and planning legislation is forcing metropolitan area planners to consider transport and land use together.*

Still, B. "Transport impacts on land use: potential methods and their relevance to strategic planning" in Transportation Planning Methods, Volume 1: Seminar E (P414), European Transport Forum, (PTRC) September 1997 pp255-268.

Thomas, H., Smart, A. & Nickson, R. “Central Leicestershire: a sustainable transport and land use policy for the 21st century” in Policy, Planning and Sustainability: Seminar B (P421), European Transport Conference, (PTRC & AET) September 1998 pp223-230.

Van Koningsbruggen PH, Borgman GJ “TIGRIS - understanding the interaction between transport and land use through decentralization” in Models and Application, Seminar F, (P393), PTRC Summer Annual Meeting, September 1995 pp75-93.

Wisconsin University (Centre for Urban Transportation Studies and School of Architecture and Urban Planning), “The new suburb: guidelines for transit sensitive suburban land use design”, for Urban Mass Transportation Administration, US Dept of Transport. (Date?)

Yaxley M, Gilder I “Integrating land-use, transport and environmental policies - the developing world can manage it but do we ever stand a chance?” in Environmental Issues, Seminar C, (P375), PTRC Summer Annual Meeting, September 1994 pp187-206.

Modern concepts of public transport corridors

(keywords are “Transit oriented development”, “transit sensitive development”, “urban villages”, “new urbanism”, “sustainable urban form”, “public transport corridors”)

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*Newman, P, 1993, “Resisting automobile dependence: transit oriented development in principle and practice”. *Gives an overview of TOD, with specific reference to Australian cities. It comments that European and Asian cities continue to have strongest resistance to car dependency.*

*Wacher, T, 1971, “Public transport and land use: a strategy for London”, reprinted from the *Chartered Surveyor*, July 19971. *Makes the case for higher density development within 500 metres of Underground stations. Includes a review of foreign examples including inter alia Stockholm and Toronto.*

2. Transport planning

Type, capacity levels of service, population/passenger thresholds for different systems

General

*Hillman, R and Pool, G, "GIS-based innovations for modelling public transport accessibility" in Traffic Engineering & Control, October 1997, pp 554-559.

*Institution of Highways and Transportation, 1996, "Developing urban transport strategies", IHT, London. *Deals with the processes of developing integrated land use and transport plans, and thius will still be relevant in the context of the new Local Transport Plans.*

* Institution of Highways and Transportation, 1997, "Transport in the Urban Environment", IHT, London. *Deals with public transport mostly as an element of road traffic. There is limited commentary on bus station layout and segregated busways.*

*Knowles, R 1992, "Light rail transport" in Whitelegg, J (ed) "Traffic congestion: is there a way out?"., Leading Edge Press, Hawes, 1992. *Gives a table showing typical characteristics of urban rail systems drawn from a number of sources.*

Public transport accessibility

Kerrigan, M and Bull, D, 1992, "Measuring accessibility – a public transport accessibility index", paper to PTRC Summer Annual Meeting, September 1992. *Authors' own description of the PTALS method adopted in LB Hammersmith & Fulham.*

Gardner, K, 1997, "Public transport accessibility levels (PTALS: issues in the planning process", presentation to Planning Inspectorate Inspectors' Training Conference, 24th April 1997.

O'Hanlon, G, 1997, "A review of the PTAL accessibility index in London", postgraduate dissertation, University of Birmingham.

Rail corridors and other segregated systems

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