

# Land use and transport planning – update (2006-2009)





**CURRENT TOPICS IN TRANSPORT  
NO. 16.5**

**LAND USE AND TRANSPORT PLANNING – UPDATE  
(2006-2009)**

This issue of Current Topics includes over 65 abstracts of reports, conference papers, books and journal articles which focus on *the relationship between land use and transport, with a special emphasis on policy and planning issues. Abstracts are included on studies on sustainable transport policy, ways of preventing urban sprawl, land use effects on travel behaviour, modelling the interaction between urban land use and transport, accessibility studies, planning mixed use developments to reduce the need to travel, and land use planning for pedestrians and public transport.* These items have been selected from the material added to the Transport Research Laboratory's Library Database between 2006 and 2009. Much of the relevant English language published literature from the UK, USA, Australia and Europe is included; some of the non-UK literature is included courtesy of the OECD International Transport Research Documentation (ITRD) database.

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## LAND USE AND TRANSPORT PLANNING – UPDATE (2006-2009)

### **The impact of railway station development on urban dynamics: a review of the Amsterdam South Axis Project**

Bruinsma, F

Built Environment  
Alexandrine Press  
(1 the Farthings, Marcham, Oxon, OX13 6QD,  
United Kingdom)  
2009 / v35(n1) p107-121 / 33 refs  
ISSN: 0263-7960

Railway station area development and urban dynamics are examined in relation to recent Dutch research on the indirect and external effects in addition to the standard cost benefit analysis framework. The research was directed mainly towards the development of the Amsterdam South Axis urban area: a major mixed land use project in which real-estate development - offices, dwellings and facilities - is combined with large infrastructure projects, including among others, the development of a high speed train station.

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### **An area-level model of vehicle-pedestrian injury collisions with implications for land use and transportation planning**

Wier, M  
Weintraub, J  
Humphreys, EH  
Seto, E  
Bhatia, R

Accident Analysis & Prevention  
Elsevier Science Ltd  
(The Boulevard, Langford Lane, Kidlington,  
Oxford, OX5 1GB, United Kingdom)  
2009-01 / v41(n1)p137-145 / 57 refs

There is growing awareness among urban planning, public health, and transportation professionals that design decisions and investments that promote walking can be beneficial for human and ecological health. Planners need practical tools to consider the impact of development on pedestrian safety, a key requirement for the promotion of walking. Simple bivariate models have been used to predict changes in vehicle-pedestrian injury collisions based on changes in traffic volume. We describe the development

of a multivariate, area-level regression model of vehicle-pedestrian injury collisions based on environmental and population data in 176 San Francisco, California census tracts. Predictor variables examined included street, land use, and population characteristics, including commute behaviors. The final model explained approximately 72% of the systematic variation in census-tract vehicle-pedestrian injury collisions and included measures of traffic volume, arterial streets without transit, land area, proportion of land area zoned for neighborhood commercial and residential-neighborhood commercial uses, employee and resident populations, proportion of people living in poverty and proportion aged 65 and older. We have begun to apply this model to predict area-level change in vehicle-pedestrian injury collisions associated with land use development and transportation planning decisions. (A) Reprinted with permission from Elsevier.

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### **Informing the public of transportation-land use connections**

Yang, J  
Ferreira, J

Transportation Research C  
Elsevier Science Ltd  
(The Boulevard, Langford Lane, Kidlington,  
Oxford, OX5 1GB, United Kingdom)  
2009-02 / v17(n1)p27-37 / 25 refs

The lack of relevant information is a significant barrier when policy makers try to motivate local communities in regional transportation-land use planning. This article demonstrates a workable approach to overcoming this information gap. Large data sets and research results are preprocessed to provide the information on regional transportation-land use connections. Web-based open source geo-spatial technologies are employed to reduce the cost of information dissemination while maintaining a high level of accessibility. Maps and graphs are dynamically generated to ensure that relevant information is delivered in easy-to-understand formats. Two illustrative examples are presented in this article to show how local planners can possibly benefit from this approach when developing stories of community growth, accessibility, mobility,

and transportation–land use connections in a regional context. (A) Reprinted with permission from Elsevier.

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**Growing Neighborhoods in Growing Corridors: Land Use Planning for Highway Noise**

Montana Department of Transportation  
(2701 Prospect Avenue, P.O. Box 201001,  
Helena, MT, 59620-1001, USA)  
Headwaters Policy/Planning Partnership, LLP  
(737 5th Avenue, Helena, MT, 59601, USA)  
Federal Highway Administration Office of Noise  
Abatement  
(400 7th Street, SW, Washington, DC, 20590,  
USA)  
2008-03 / 52p / + refs

This document aims to provide technical assistance to local authorities that wish to consider noise as an integral part of land use planning decisions. It provides tools to help local planning staffs and policy makers consider noise impacts as a routine part of their development regulations and review processes. Montanans tend to want economic development, and many areas of the state are getting it. People move here, in part, to get away from the hectic pace of bigger cities. With development, the potential for conflicts between traffic noise and noise-sensitive land uses is almost certain to increase. Meeting the traffic noise challenge, while developing attractive communities and essential transportation corridors, will require sustained action at the state and local levels. Cooperative efforts and actions to avoid highway traffic noise problems are smart for residents, local governments, and the state. This toolkit was developed to help local governments address the challenges of highway noise. The local basis for addressing noise may be found in local planning goals and objectives that are common elements of local policies that address public health, safety and welfare, and general quality of life. Integrating noise as a regulatory or programmatic consideration in local land use planning is likely to require modification of local policies and programs. This document provides model language that may be considered for integration into growth policies, subdivision regulations, zoning regulations, and land acquisition efforts. The Montana Department of Transportation crafted this because highway noise issues are very likely to become more significant in many areas of the state, and because state and federal agencies cannot

address them all. Local decision makers are likely to become increasingly responsible for noise impacts arising from land use decisions.

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**Dynamics of clustered employment growth and its impacts on commuting patterns in rapidly developing cities**

Alpkokin, P  
Cheung, C  
Black, J  
Hayashi, Y

Transportation Research A  
Elsevier Science Ltd  
(The Boulevard, Langford Lane, Kidlington,  
Oxford OX5 1GB, United Kingdom)  
2008-03 / v42(n3)p427-444 / 39

Trends in suburban clustered employment growth (poly-centric development) occur in large cities. Decentralized employment growth is complicated and subject to many factors. In fast growing cities of the developing world analysis is rarely undertaken when formulating master plans or spatial plans. An analytical framework of research aims, suitable techniques, and outcomes for policy analysis are described. Its practical utility to identify clusters and their dynamics is explored with available data for 1985 and 1997 for Istanbul. Impacts on commuting patterns (trip lengths, employment destination zonal preference functions and mode shares) are analyzed for each type of sub-center identified in Istanbul, and some findings contrasted with North American cities where such research into the dynamics of employment clusters has been undertaken. (A) Reprinted with permission from Elsevier.

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**Linking Land Use and Transit: Planning at the Corridor Level**

Baldwin, T

Mass Transit  
Cygnus Publishing, Incorporated  
(1233 Janesville Avenue, P.O. Box 803,  
MELVILLE, NY, 53538-0803, USA)  
2008-09 / v34 (n6) / 38,40,42,44 / - refs  
ISSN: 0364-3484

This article focuses on the Fort Worth Transportation Authority's (The T's) comprehensive corridor planning efforts. In 2005, the T's board

of directors completed a strategic plan that included a proposal for a second commuter rail system to begin operation within four to 10 years. The project, the Southwest-to-Northeast Rail Corridor projects, links southwest Fort Worth with downtown as well as the rapidly growing northeastern side of Tarrant County, downtown Grapevine and Dallas-Fort Worth International Airport. A final Environmental Impact Statement is expected in 2009. The 37-mile system includes 13 new stations, and the T is proactively encouraging transit-oriented development around these proposed station sites. The process includes four components: constraints and opportunities analysis; economic analysis; a transit-oriented development scenario framework; and a final report. The author explains in detail how these components have been handled thus far.

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**Land Use-Transportation Scenario Planning in an Era of Global Climate Change**

Bartholomew, K  
Ewing, R

Conference Title: Transportation Research Board 87th Annual Meeting. Location: Washington. Held: 20080113-20080117  
Transportation Research Board (TRB)  
(2101 Constitution Avenue NW, Washington, DC, 20418, USA)  
2008-00 / 20p / + refs

This paper focuses on the role land use-transportation scenario planning might play in assessments of climate change policy options. To focus on this question, the paper presents a meta-analysis of recent scenario planning projects, using descriptive and multivariate techniques. The paper observes that the use of land use patterns as a variable in transportation planning has become common, and that the practice further demonstrates statistically significant links between land use and travel patterns and shows the importance of incorporating land use strategies in the development of policies aimed at reducing greenhouse gas (GHG) emissions. The paper concludes with suggestions on how scenario planning practice might change to better meet the policy challenges inherent in climate policy formulation.

**Local transport funding guidance for funders of transport schemes**

Binsted, A  
Brannigan, C

Published Project Report  
TRL Limited  
(Crowthorne House, Nine Mile Ride,  
Wokingham, Berkshire RG40 3GA, United Kingdom)  
2008 / PPR327 / 17p / 12  
ISBN: 1846087139  
ISSN: 0968-4093

This guidance note is aimed at potential funding authorities and organisations of transport and land use schemes and projects. The guidance note identifies and examines the funding barriers faced by local authorities and the potential implications these may have on both the organisations and the resultant schemes. Recommendations have been made as to how funding mechanisms and associated process can be improved. The guidance note is based on the barriers and issues identified in the wider DISTILLATE research and research with local authority case studies. (A)

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**Integrated Transportation and Land Use Scenario Modeling Using Casewise Visual Evaluation: Case Study Jeffersonville, IN**

Blandford, BL  
Grossardt, T  
Ripy, J  
Bailey, K

Conference Title: Transportation Research Board 87th Annual Meeting. Location: Washington. Held: 20080113-20080117  
Transportation Research Board (TRB)  
(2101 Constitution Avenue NW, Washington, DC, 20418, USA)  
2008-00 / 17p / + refs

Transportation and Land Use Planning are generally poorly coordinated, and the preferences of the general public are not well integrated into either of these activities. Particularly, appropriate land use patterns that meet the needs and desires of the public and the public sector are difficult to develop because of their extreme complexity and potential for disproportionate impacts on citizens. A Structured Public Involvement (SPI) protocol was developed to allow large groups of citizens to participate efficiently

and effectively in the Comprehensive Planning Process for a moderate sized town in Indiana, helping to partially overcome this problem. CommunityViz was used as the visualization tool to help residents better understand the differences between potential land development patterns; and fuzzy set modeling was used to derive the complex interplay of development pattern properties that were most preferred and least preferred by citizens. The development patterns varied by percent mixture of housing types, percent mixture of land use types, percent given over to green space, the ratio of sidewalk to total paved area, and the connectivity of the road network. These five parameters were chosen as the most useful and fundamental measures of differences between development patterns, and citizens' preferences were derived based on them. Public input for this town was successfully modeled and the resulting preference patterns made available to city planners for use in updating their comprehensive plan. This research demonstrates a practical method of involving citizens in an orderly, useful manner in questions of joint transportation and land use planning.

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**Developing land use and transport PSS: Meaningful information through a dialogue between modelers and planners**

Broemmelstroet, M  
Bertolini, L

Transport Policy  
Elsevier Science Ltd  
(The Boulevard, Langford Lane, Kidlington,  
Oxford, OX5 1GB, United Kingdom)  
2008-07 / v15(n4)p251-259 / 74 refs

One of the key barriers to integration of land use and transport planning is the lack of a "common language" (i.e. tools, instruments, indicators) that can support planners from both domains in developing shared visions and integrated strategies. Many of such tools and indicators have been developed in recent years, but not so many are implemented in practice. In this paper a new, participatory development approach for planning support systems (PSS) is proposed, termed "mediated planning support" (MPS) that addresses bottlenecks blocking this implementation. It is founded on insights from knowledge management, system dynamics and software innovation and is applied in the Greater Region of Amsterdam. This paper discusses the evolution of the PSS, highlighting the most useful elements which can be applied in other land use

and transport planning projects. It offers insights for practitioners and researchers interested in land use and transport planning integration and for professionals that are dealing with supporting planning with information and technologies. (A) Reprinted with permission from Elsevier.

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**Estimating Bicycle and Pedestrian Demand in San Diego**

Buckland, L  
Jones, MG

Conference Title: Transportation Research Board 87th Annual Meeting. Location: Washington. Held: 20080113-20080117  
Transportation Research Board (TRB)  
(2101 Constitution Avenue NW, Washington, DC, 20418, USA)  
2008-00 / 17p / + refs

This paper introduces the concepts behind estimating bicycle and pedestrian demand and provides an example of the development of a sketch-plan method for estimating bicycle and pedestrian demand from land use in San Diego County. The paper describes the methodology involved in collecting counts for the currently ongoing Seamless Travel project. The Seamless Travel project intends to develop a model for estimating bicycle and pedestrian demand within San Diego County. The project methodology includes conducting bicycle and pedestrian counts and intercept surveys over a two-year period throughout the County and evaluating the effects that socio-demographic factors and physical factors have on walking and biking rates within the County. The project is funded by Caltrans Division of Innovation and Research and is being conducted by the Traffic Safety Center of University of California Berkeley and Alta Planning + Design.

**Integrated railways-based policies: The Regional Metro System (RMS) project of Naples and Campania**

Cascetta, E  
Pagliara, FP

Transport Policy  
Elsevier Science Ltd  
(The Boulevard, Langford Lane, Kidlington,  
Oxford OX5 1GB, United Kingdom)  
2008-03 / v15(n2)p81-93 / 31

The Campania Regional Metro System (RMS) project is an example of integrated land-use, infrastructure and operational planning. The whole project is based on the idea of integrating the existing railway lines into a single physical network by building some new links, new stations and new modal interchange facilities. The RMS project integrates also operational components such as service lines, timetables and integrated pricing. In addition to the transit “supply-side” elements, the project includes relevant “demand-side” aspects, including town planning based on the rail network, urban renewal around rail stations and upgraded and new stations with high architectural standards and a new symbolic value. This paper describes the general structure of the project. It also discusses some preliminary results on land-use and modal shift after the implementation of the first stage of the project, which included 43 km of new railways lines, 30 new stations, an integrated timetable and a single integrated ticket. (A) Reprinted with permission from Elsevier.

**Residential Self-Selection and Nonwork Travel: Evidence Using New Data and Methods**

Chatman, DG

Conference Title: Transportation Research Board 87th Annual Meeting. Location: Washington. Held: 20080113-20080117  
Transportation Research Board (TRB)  
(2101 Constitution Avenue NW, Washington, DC, 20418, USA)  
2008-00 / 42p / + refs

Residents of dense, mixed-use, transit-accessible neighborhoods use autos less. Recent studies have suggested that this relationship is partly because transit- and walk-preferring households seek and find such neighborhoods. If so, policies to alter the built environment may not influence

auto use very much if the number of such households is small. I argue that these studies are largely inconclusive on methodological grounds, and more research is needed. Here a purpose-designed survey of households in two urban regions in California is investigated using improved analytical methods. Many households in this data set explicitly consider travel access in choosing a neighborhood, but this process of residential self-selection does not bias estimates of the built environment’s effects very much. To the extent that it does, failing to account for residential self-selection may actually result in research underestimating built environment effects. The results strengthen the argument for not only deregulatory approaches to land use and transportation planning, but for market interventions such as subsidies and new prescriptive regulations.

**Land Use, Attitudes, and Travel Behavior Relationships: A Cross-Sectional Structural Equations Model for Northern California**

Circella, G  
Mokhtarian, PL  
Handy, SL

Conference Title: Transportation Research Board 87th Annual Meeting. Location: Washington. Held: 20080113-20080117  
Transportation Research Board (TRB)  
(2101 Constitution Avenue NW, Washington, DC, 20418, USA)  
2008-00 / 29p / + refs

This paper focuses on the interactions between land use (LU) and travel behavior (TB), with the goal of increasing the understanding of the causal links among residential location, car ownership and travel behavior. These relationships are analyzed through the use of a structural equations model (SEM), based on survey data collected from residents of eight neighborhoods in Northern California. A cross-sectional analysis is carried out, in order to separately identify the influence of socio-demographics and attitudes on residential location and travel behavior, and distinguishing the impact of attitudes on TB from that of the built environment (BE) itself. In particular, the research aims at testing the hypothesis that residential self-selection (RSS) accounts for a significant portion of the impact of the BE on TB. The results confirm strong interactions among the built environment, car ownership and the travel behavior of residents. Moreover, the study

highlights the relevance of personal attitudes, in particular with reference to accessibility, as important explanatory variables for the choice of residential location. A concurrent role of the BE and of RSS is found relevant in determining TB. The cross-sectional nature of the analysis allows exploring different directions of causality between car ownership and TB, and between land use attitudes and TB. Strong associations are found among these variables, although some degree of ambiguity persists on the definition of the dominant direction of causality.

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**Nonlinear, Secondary Impacts of Large Urban-Edge Developments as Evidence of Path Dependency in Integrated Land Use and Transportation Model**

Clay, MJ  
Andersen, KM

Conference Title: Transportation Research Board 87th Annual Meeting. Location: Washington. Held: 20080113-20080117  
Transportation Research Board (TRB)  
(2101 Constitution Avenue NW, Washington, DC, 20418, USA)  
2008-00 / 25p / - refs

The practice of integrated land use and transportation modeling has improved greatly over the past decade. The use of these “integrated” models has steadily increased among U.S. metropolitan planning organizations (MPOs) and more recently among state departments of transportation. This paper examines the secondary growth impacts of large, urban-edge developments within an integrated model to determine the existence and characteristics of induced land development (sometimes referred to as path dependency in the modeled land development process). The Sacramento MEPLAN model is used to simulate the impact of large, urban-edge, basic sector developments on overall and industry-specific employment in the subject zone over a modeled 25-year period. Four types of basic sector development are considered: office/service, industrial/manufacturing, retail, and government. Ten sizes of each type of development were modeled, and each simulated development shares a common location and year of construction/occupancy. The study found that: 1) secondary employment draw was substantial for all sizes and types of projects; 2) certain industries produced much larger secondary draws than others; 3) secondary growth increased with the size of the development, and continued

to have impact though all future modeled years; and 4) the relationship between initial development size and secondary growth is non-linear within each development type. This significant, persistent secondary draw suggests that this model manifests a key characteristic of path dependency in the location and building decisions within the model (i.e. a relatively small shift in basic employment can create new development “paths”). These findings yield recommendations for incorporating this work into integrated modeling research and practice.

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**Planning for sustainable accessibility: The implementation challenge**

Curtis, C

Transport Policy  
Elsevier Science Ltd  
(The Boulevard, Langford Lane, Kidlington, Oxford OX5 1GB, United Kingdom)  
2008-03 / v15(n2)p104-112 / 61

The ‘Network City’ planning strategy espouses sustainable accessibility. The aim is to re-orient the existing urban structure by focussing development at places with high accessibility in order to support an effective public and private transport system. The implementation phase calls for changes to planning practices: the need for public transport planning and development change to be mutually supportive; the need for road network planning and road design to place land use-transport integration as the core objective rather than traffic efficiency and for the need to stage development according to planned population and employment targets. This must take place within a new participatory approach. All this requires planners to gain new skills. To achieve this the system of planning must remain strong. (A) Reprinted with permission from Elsevier.

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## **Transit Use at Portland Area Transit-Oriented Developments**

Dill, J

Conference Title: Transportation Research Board 87th Annual Meeting. Location: Washington. Held: 20080113-20080117  
Transportation Research Board (TRB)  
(2101 Constitution Avenue NW, Washington, DC, 20418, USA)  
2008-00 / 17p / + refs

In recent years there has been a growing interest in using land use planning to reduce reliance on the automobile long-term, through ideas such as smart growth, New Urbanism, pedestrian pockets, and transit-oriented development (TODs). Portland's planning agencies, including the regional government (Metro), were early adopters of TOD concepts. This research surveyed residents of TODs in the Portland area about their travel behavior, housing choices, and mobility preferences. The survey collected data from over 300 residents near four different light rail stations in the Portland region. The neighborhoods were selected to represent a range of types of TODs, while controlling somewhat for income (through housing styles and prices) and regional and transit accessibility. None of the neighborhoods completely satisfies generally agreed upon standards for good TODs: higher density, good land use mix, pedestrian friendly, and close to transit. The research found that households in the neighborhoods tend to be smaller than the surrounding cities, often without children. The residents of the surveyed TODs are not transit dependent, though they did take transit to work or school at a significantly higher rate than residents citywide. The varying physical features of the TODs did not appear to affect transit commuting, but did influence non-commute travel mode choices. Parking pricing at work or school was an important factor in commute mode choice. A significant share of respondents now commute by transit who did not before.

## **An integrated evaluation method of accessibility, quality of life, and social interaction**

Doi, K  
Kii, M  
Nakanishi, H

Environment & Planning B  
Pion Limited  
(207 Brondesbury Park, NW2 5JN, United Kingdom)  
2008-11 / v35(n6) p1098-1116 / 31 refs  
ISSN: 0265-8135

Since accessibility is an essential factor in land-use and transport planning, several methods have been developed to evaluate it. Nevertheless, it has seldom been an essential part of performance measures for policy evaluation from the viewpoint of individuals' quality of life (QoL). The objective of this study is to develop an integrated evaluation method of accessibility, QoL, and social interaction which contributes to the evaluation of land-use and transport policies for liveable and sustainable urban development. In this paper, based on quantification of the weights of multi-elements of QoL, a QoL-based accessibility measure and a QoL performance measure were developed to address appropriate policies of land-use transport coordination and integration by disentangling the mismatch between real urban structures and people's demand for QoL. Furthermore, embryonic ideas for the development of a generalised framework of QoL evaluation are explored, incorporating social interactions and institutional design which link the QoL concept with quality of space and quality of procedure.

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## **Living on the edge: transport sustainability in Perth's liveable neighbourhoods**

Falconer, R  
Newman, P  
Giles-Corti, B

PATREC Research Forum, 2008, Perth, Western Australia, Australia  
Planning and Transport Research Centre (PATREC)  
(GPO Box U1987, Perth, Western Australia, 6845, Australia)  
2008-10 / 20p / 13 refs

Research is increasingly linking sprawl and car dependence with social justice issues because

people on limited income and with decreased mobility struggle to undertake activities of daily life. In response to these concerns the Western Australian planning system introduced Liveable Neighbourhoods, a new design code, which was intended to reduce car dependence and sprawl. This code has its roots in New Urbanism and appears to have been taken up more rapidly in Perth than elsewhere. This paper reports on the first large-scale assessment of transport sustainability in Perth's Liveable Neighbourhoods and in a broader sense, evaluates the transport sustainability of New Urbanism and forms part of the RESIDential Environment (RESIDE) Project. This paper presents the findings of a travel survey, RESIDE participant perception survey and environmental study. More generally, the paper questions the extent to which New Urbanism can promote a sustainable transport agenda wherever it is applied without mandating for increased land use and transit, not simply local permeability and footpaths. (a)

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**Urban Form, Individual Spatial Footprints, and Travel: An Examination of Space-Use Behavior**

Fan, Y  
Khattak, AJ

Conference Title: Transportation Research Board 87th Annual Meeting. Location: Washington. Held: 20080113-20080117  
Transportation Research Board (TRB)  
(2101 Constitution Avenue NW, Washington, DC, 20418, USA)  
2008-00 / 21p / + refs

Land use and transportation planning can benefit from deeper insight into the space-use options that individuals have. This paper examines how individuals' uses of space are related to urban form factors at their residences, after controlling for traffic congestion, weather, and individual/household characteristics. Behavioral data analyzed come from the 2006 Greater Triangle Region Travel Study in North Carolina. Individuals' uses of space are measured by daily activity space—the minimum convex polygon that contains all the daily activity locations—and daily travel distance, and are estimated by spatial regression models. Results show that residents of densely developed neighborhoods with more retail stores and better connected streets generally have smaller area size of daily activity space and shorter daily travel distance. Additionally, urban form factors are compared

in terms of their importance in explaining individuals' space-use behavior. This paper finds that retail mix and street connectivity are key factors relating to individuals' uses of space while building density is less important. The findings shed light on possible land use solutions towards a better coordination of services in space.

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**The state of Australian cities: an overview**

Forster, C  
Hamnett, S

Built Environment  
Alexandrine Press  
(1 the Farthings, Marcham, Oxon, OX13 6QD, United Kingdom)  
2008 / v34(n3) p241-54 / 34 refs  
ISSN: 0263-7960

Australia's five main cities have low urban density, very high levels of car dependence and high levels of car ownership. The importance of pursuing sustainable urban development was acknowledged in Australian metropolitan plans of the early 1990s. A decade and a half later Australian cities are still low in density and car dependent but residential densities have increased and housing has become much less affordable. Sydney, Melbourne, Perth and Adelaide all rank highly for livability in surveys of world cities. However major concerns are being expressed about falling housing affordability and persistent problems of social exclusion. In all five cities, journeys by the greenest modes of walking and cycling were below 5%. A history of land use planning is given. Planning policy now involves revitalising railway lines and new self-contained towns based on existing railway corridors.

**How Cities Can Increase Density & Avoid Concurrency Issues Using High Frequency Transit/TOD**

Hochschild, MA

Conference Title: 2008 American Public Transportation Association (APTA) Bus & Paratransit Conference. Location: Austin. Held: 20080503-20080507  
American Public Transportation Association (1666 K Street, NW, Washington, DC, 20006-, USA)  
2008-00 / 26p / + refs  
ISBN: 1931594309

This paper describes how transportation is one of the most important aspects of a community's infrastructure and it has tremendous influence on its land use decisions, rates of growth and quality of life. Not only is the transportation network a factor in the determination of how well a city works, but if left alone (be free from excessive and often competing local government regulations), a region's land use patterns can influence in a positive way the building of transportation modes that provide for the needs of interurban travelers by allowing transit to be an attractive alternative to the private automobile. Since the implementation of federal highway legislation in 1954, the automobile has become the dominate form of transportation in the nation's cities and everywhere else. Highways in urban areas, a lack of marketable urban infill construction and various growth management programs supported by state and local governments, have contributed to urban sprawl. This phenomenon is characterized by low-density, single-family suburban development. All of which has brought about the decline of public transit as a mode of interurban travel. This development has: (1) caused a great disconnect between the areas where people work and where they live; (2) encouraged development in areas not served by public transit; and (3) created a pattern of development in suburban areas that ensures dependence on the automobile as the primary means of travel for every need.

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**Optimal Accessibility Landscapes? New Methodology for Simulating and Assessing Jobs-Housing Relationships in Urban Regions**

Horner, MW

Conference Title: Transportation Research Board 87th Annual Meeting. Location: Washington. Held: 20080113-20080117  
Transportation Research Board (TRB) (2101 Constitution Avenue NW, Washington, DC, 20418, USA)  
2008-00 / 20p / + refs

Research into land use-transportation relationships through the lens of the 'jobs-housing balance' and the closely-related 'excess commuting' framework continues to draw substantial interdisciplinary attention. There have been several recent research efforts aimed at extending the excess commuting framework and its GIS-based spatial models to more prescriptive, policy-relevant situations. This paper puts forward the idea of a theoretical 'optimal' urban jobs-housing balance and proposes a new spatial model for finding it. The developed model treats the region's theoretical minimum commute as a baseline indicator of jobs-housing balance. Alternative patterns of workers and jobs are simulated in order to improve this indicator. The model is demonstrated in several scenarios using data from the decennial U.S. Census (2000). Results demonstrate the model's capability for finding 'optimal' spatial distributions of jobs and housing, as well as pointing out the inefficiencies in existing urban structure. Summary remarks and suggestions for future research are provided.

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**Measuring and Visualizing the Diversity of Land Use and Its Relationship with Travel Behavior**

Hossack, GS

Conference Title: Transportation Research Board 87th Annual Meeting. Location: Washington. Held: 20080113-20080117  
Transportation Research Board (TRB) (2101 Constitution Avenue NW, Washington, DC, 20418, USA)  
2008-00 / 12p / + refs

This paper discusses the methodology that the Sacramento Area Council of Governments (SACOG) is applying to calculate, visualize, and analyze diversity of land use and it's relation to travel behavior. Specifically, this work describes

the technique of calculating the diversity of land use within a half-mile of households and its effects on non-motorized travel and vehicle trip length. This technique requires that land use information be available at the parcel, or neighborhood, level instead of being aggregated to larger tract or transportation analysis zone (TAZ) level. Since SACOG is currently applying a parcel-level, activity-based travel model, it is necessary to develop the performance metrics that take advantage of this level of spatial detail. Furthermore, with regional initiatives pushing for “smart growth” and mixed-use development, it is necessary to have a quantitative method that measures a future scenario’s index of land use diversity which will determine if it can help reduce congestion by positioning retail, school, and service-based jobs near homes.

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**Better integration of land use and transport at a regional level: scoping of regional guidelines**

Hunter, P  
Allan, S  
Heslop, V  
Winefield, P  
Mcdavitt, T

New Zealand Transport Agency Research Report  
New Zealand Transport Agency  
(Private Bag 6995, 6141, New Zealand)  
2008 / (n354) / 104p / - refs  
ISBN: 9780478334128  
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The integration of land use and transport is considered to be a key priority in delivering a sustainable transport system, yet its implementation remains problematic. The Integrated Approach to Planning (IAP) project has identified both the barriers to implementation and a range of approaches that seek to achieve better integration of land use and transport. This report contributes to the IAP project by scoping the contents of a toolbox specifically designed to assist regions to better integrate land use and transport and by recommending to Land Transport NZ the content for the toolbox and how it should be developed. A toolbox approach recognises that New Zealand’s regions vary greatly in size, complexity and the issues that they have to deal with, and as such ‘one size does not fit all’. The approach to scoping the toolbox was to research a range of tools across the spectrum of six key action areas

developed by the IAP project: legislation; policy (non-legislative); institutional frameworks; funding; planning practice (implementation); and capacity and capability. These tools were discussed with members of a steering group who provided a breadth of knowledge and experience from across New Zealand, and assisted in the refinement of the tools and prioritisation of the elements of a regional toolbox that form the recommendations in this report. (a)

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**Sustainability Assessment at the Transportation Planning Level: Performance Measures and Indexes**

Jeon, CM  
Amekudzi, AA  
Guensler, R

Conference Title: Transportation Research Board 87th Annual Meeting. Location: Washington. Held: 20080113-20080117  
Transportation Research Board (TRB)  
(2101 Constitution Avenue NW, Washington, DC, 20418, USA)  
2008-00 / 26p / + refs

As the word “sustainability” becomes more and more prevalent throughout various disciplines, the definition of a sustainable transportation system is still controversial. However, there is emerging consensus that transportation system sustainability should capture attributes of system effectiveness and system impacts on economic development, environmental integrity, and the social quality of life. Sustainability assessment can be incorporated at the plan level in order to influence decision making, and support policies that affect regional sustainability. This paper reviews methodologies that can be applied in sustainability assessment in transportation planning in order to shed light on the procedures being used to incorporate sustainability more effectively in the planning process. Using a case study of Atlanta Metropolitan Region, the study identifies performance measures based on sustainability issues and regional goals and evaluates proposed transportation and land use alternatives. The study evaluates and discusses several performance measures and aggregates them into indexes representing four parameters of sustainability: system effectiveness, environmental, economic, and social impacts, to enable visualization and assessment of tradeoffs and dominance for the competing alternatives. This study is potentially useful to agencies interested in

understanding the range of tools being used for sustainability assessment, expanding or refining their performance measures to capture sustainability in transportation planning, and using them in evaluating tradeoffs among competing alternatives as well as in identifying dominant alternatives.

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### **Modeling the Travel Impacts of Smart-Growth Strategies**

Loudon, WR  
Parker, T

Conference Title: Transportation Research Board 87th Annual Meeting. Location: Washington. Held: 20080113-20080117  
Transportation Research Board (TRB)  
(2101 Constitution Avenue NW, Washington, DC, 20418, USA)  
2008-00 / 13p / + refs

As interest in Smart Growth strategies has grown among the city and county decision-makers responsible for making local land-use decisions, the need for methods to reflect the benefits of these strategies in travel forecasting, traffic analysis and transportation infrastructure planning has also increased. Smart Growth strategies include concentrating new development in existing urban areas, creating a mix of complementary land uses that reduces the need for longer trips, concentration of new development near transit services and site design to facilitate pedestrian, bicycle and transit travel. The California Department of Transportation sponsored a research project to review the current practice by cities and counties to model travel impacts of new development and their ability to reflect Smart Growth benefits. This paper provides the results of that research and includes an assessment of the limitations in Smart-Growth sensitivity of the standard four-step models used by most jurisdictions, a review of how improvements in travel models can improve the sensitivity and a review of new methods that have emerged as supplemental tools for reflecting the desired sensitivity. The research has led to recommendations for practice by cities and counties in California and recommendations for how additional research could improve the tools available.

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### **Estimating Transportation Costs for Households by Characteristics of the Neighborhood and Household**

Makarewicz, C  
Haas, PM  
Benedict, A  
Bernstein, S

Conference Title: Transportation Research Board 87th Annual Meeting. Location: Washington. Held: 20080113-20080117  
Transportation Research Board (TRB)  
(2101 Constitution Avenue NW, Washington, DC, 20418, USA)  
2008-00 / 20p / + refs

Since information on US household expenditures has been collected, transport expenditures have risen from the sixth highest share of household budgets, less than two percent in 1917, to the second highest share since the 1970s. This rise is linked to increased auto purchase and maintenance and a relative decline in costs for other items, namely food. Studies also link travel expenditures to differences in the built environment. However, since the annual Consumer Expenditure Survey is reported at the metropolitan level, it cannot be used to test this latter influence. Regional travel demand models recognize the dual influence of land use and household characteristics, but do not include sufficient detail on the built environment of each neighborhood. Additionally, these models report travel time, distance, and frequency, but not out-of-pocket household transportation expenditures. Therefore, this study was launched to create a statistical model to predict household total annual transportation expenditures for each neighborhood in the largest regions in the US given the built environment and household size and income. The model uses seven independent variables to measure density, jobs access, neighborhood services, walkability, and transit connectivity. Model parameters were calibrated to actual auto ownership and transit use in the pilot region, Minneapolis-St. Paul, and to vehicle miles traveled by block group in the National Household Travel Survey. Statistically significant results confirm the influence of the built environment and regional accessibility on transport expenditures. Intended users are households, policy makers, and planners making location, design and investment decisions.

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**CORE 2008: the integration of rail transit and land use in Western Australia: the planning behind Perth's expanded rail system**

Martinovich, P

PATREC Research Forum, 2008, Perth, Western Australia, Australia  
Planning and Transport Research Centre (PATREC)  
(GPO Box U1987, Perth, Western Australia, 6845, Australia)  
2008-10 / 9 refs

The traditional understanding of mass transit rail is its application to serve high density settlement. This paper is about the application of mass / rapid transit rail to low density settlement in a city of just over 1.5 million people and rapidly expanding over a 135 kilometre long, narrow, corridor. The paper is also a case study of planning a transit system stretching 72 kilometres from the City of Mandurah to Perth over a period of ten years beginning in 1992. The paper discusses the importance of the master planning process, which quantifies the demand and then follows a logical process of scope definition to reduce uncertainty and give confidence to the cost estimates that result. The topical issue of transit oriented development is addressed in the paper and how that relates to Perth. A brief description is included of the new MetroRail project, the vehicle by which a A\$1.65 billion expansion to the Perth suburban rail network was completed in December 2007. Finally, there is a short analysis of the performance of the Mandurah line, six months after commissioning. (a)

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**Ministers could realise their ambition for car-free lifestyles in eco-towns - but only if the current shortlist of sites is abandoned**

Melia, S

Local Transport Today  
Local Transport Today Ltd  
(359 Kennington Lane, SE11 5QY, United Kingdom)  
2008-05-30 / 2008-06-12 / (n495)p14 / 0 refs

Car-free living is central to the ethos of eco towns. Comparing German and UK eco towns, the author identified much higher percentages of driving to work in the UK. He looks at whether this pattern is inevitable or whether there are circumstances where people make different choices. Identifying reasons why some people live without a car, he

found car-free choosers tend to be younger and more affluent than other non car owners. The majority of car-free choosers live in larger towns and cities and good access to facilities and rail networks are important to them. Small towns linked to, but separated from larger conurbations tend to suffer from car dependency. The government has been advised develop eco towns as integrated towns functioning as part of an existing conurbation or as larger towns with the potential to grow towards greater self sufficiency. Few areas on the eco-town selection list fulfil the 'integrated town' criteria. The author suggests the first objective should be to integrate towns already served by rail. If this is not possible, one larger eco-town designed to grow towards self-sufficiency would cause less damage from an environmental and political point of view than car-dependent satellite towns.

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**Land Use-Based Transit Planning**

Milam, R  
Luo, A

Conference Title: Transportation Research Board 87th Annual Meeting. Location: Washington. Held: 20080113-20080117  
Transportation Research Board (TRB)  
(2101 Constitution Avenue NW, Washington, DC, 20418, USA)  
2008-00 / 13p / + refs

Bus Rapid Transit (BRT) is gaining greater interest by transportation planners and decision makers in the United States due to concerns about growing traffic congestion and a desire for improved environmental quality and sustainable land use development patterns. To help planners and decision makers, the Federal Transit Administration (FTA) recently developed the BRT Implementation Guidelines (TCRP Report 90, 2003) based on the 26 case studies located in North America, Australia, Europe, and South America. This report serves as a valuable source for the basic BRT concepts including the main system components and their types, general planning principles, and general design guidelines. However, the detailed implementation process such as BRT station selection and route alignment determination, as one of the primary and practical concerns by transportation planners and decision makers, has not been studied in detail. The purpose of this paper is to share a conceptual planning approach used to quickly evaluate potential BRT stations and alignments based on a case study in Placer County, California.

The approach relies on land use development criteria and an analogous station matching process to determine an initial range of potential ridership for future stations based on existing stations with similar land use development patterns. This information is combined to help gauge station feasibility and alignment options. The criteria used in this planning process was developed from a comprehensive literature review of the relationship between land use development and transit station ridership as well as a unique database of transit ridership and land use development intensity for over 80 existing transit stations in the San Francisco Bay Area and Sacramento region.

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**Interaction of Transportation and Land Use: Simple Model for Land Use Allocation and Transportation Demand**

Moeckel, R  
Costinett, P  
Weidner, TJ

Conference Title: Transportation Research Board 87th Annual Meeting. Location: Washington. Held: 20080113-20080117  
Transportation Research Board (TRB)  
(2101 Constitution Avenue NW, Washington, DC, 20418, USA)  
2008-00 / 19p / + refs

Most transportation modelers agree that the integration of land use is beneficial for transportation simulation. As travel demand derives from the distribution of land uses and as traffic flows shape land use by accessibilities, integrated land-use/transportation models improve transportation demand forecasts. However, there are only very few transportation models that actually integrate with land use simulations. Commonly, land uses remain unchanged over time or exogenous forecasts are used to determine population and employment distributions in future years. This paper presents an easy-to-use alternative of a land use model simulating population, employment, demand for commute trips and demand for goods flows. Using a series of Iterative Proportional Fitting (also called Matrix Balancing) it runs quickly and follows straightforward calibration procedures. The model offers “pure” transportation models a simple alternative to become an integrated transportation/land-use model.

**Caught in the Middle**

Ott, J

Aviation Week & Space Technology  
McGraw-Hill Book Company Inc  
(, New York, NY, USA)  
2008-01-28 / p58-61 / 0 refs

Reducing environmental impact and struggling with growth scenarios are currently important issues for world airports. The Airports Council International (ACI) estimates significant future capital expenditure increases for airports. In Europe, airports are preparing to meet emissions targets, which may have an impact on expansion plans. Airports have to cater for traffic growth in an environmentally responsible way. Regarding noise pollution, airports are focusing on reducing noise at source, land-use planning, noise abatement procedures and operational restrictions. Air quality issues are a problem particularly for airports flanked by major highways as it is difficult to distinguish the separate sources contributing to poor air quality. To meet the demands of Europe’s growing economies both air and rail travel modes are deemed to be essential. In America, air travel is felt to be even more important due to the longer distances involved. Measures undertaken by Dallas-Fort Worth Airport are described in more detail. Airport development is believed to be moving from “city airports” to “airport cities”, with airports expanding to take on roles previously found in cities’ commercial sectors. This change needs to be conducted in co-operation with urban, regional and business site planners, to avoid problems of access, congestion and ground pollution.

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**Allocation of Regional Growth to Enhance Mobility: Study in Washington, D.C.**

Pilko, P

Conference Title: Transportation Research Board 87th Annual Meeting. Location: Washington. Held: 20080113-20080117  
Transportation Research Board (TRB)  
(2101 Constitution Avenue NW, Washington, DC, 20418, USA)  
2008-00 / 15p / + refs

This study proposes an extended methodology to optimize land use growth allocation in a large metropolitan area, subjecting to goals and limitations of transportation system. Two

non-linear objective functions measuring transportation system performance strategies are tested: 1) minimization of system travel time, and 2) balancing the relative growth in county-to-county travel times. Modified travel demand model of Washington, DC area is used. The model is solved with genetic algorithm. The results indicate that impact of growth allocation as forecast in the Washington master transportation plan 2005-2030 will worsen system travel time by 12% and cause 67% higher variation in travel times among counties by 2030, compared to travel with optimal land use growth allocation under stated assumptions.

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**Built Environment Correlates of Walking: A Review**

Saelens, BE  
Handy, SL

Medicine and Science in Sports and Exercise  
Lippincott William & Wilkins  
(351 W. Camden Street, Baltimore, MD, 21201, USA)  
2008-07 / v40 (n7) / S550-S566 / + refs

This article reports on a literature review of the evidence on relationship between the built environment and physical activity, notably walking. The built environment is generally considered to be that part of the physical environment that is constructed by human activity. The built environment can include land use patterns, the distribution across space of activities and the buildings that house them, the transportation system, the physical infrastructure of roads, sidewalks, and bike paths, and urban design. The authors included 13 reviews published between 2002 and 2006 and 29 original studies published from 2005 through May, 2006. Results were summarized based on specific characteristics of the built environment and transportation walking versus recreational walking. The authors note that both previous reviews and newer studies show consistent positive relations between walking for transportation and density, distance to nonresidential destinations, and land use mix. However, the findings for route/network connectivity, parks and open space, personal safety, and recreational walking are not as clear. The authors conclude with a discussion of research methodology, calling for prospective designs as a better approach for establishing causality in examining relations between environment and walking. They do stress,

however, that the available evidence supports the efforts of cities throughout the United States to increase the viability of walking through innovative planning policies. For example, cities often ensure adequate infrastructure for walking in new developments by requiring private developers to provide amenities such as sidewalks, bus stops, recreational trails, parks, and sites for schools.

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**Incorporating transport energy into urban planning**

Saunders, M  
Da Silva, ANR  
Kuhnimhof, T  
Chlond, B

Transportation Research A  
Elsevier Science Ltd  
(The Boulevard, Langford Lane, Kidlington, Oxford, OX5 1GB, United Kingdom)  
2008-07 / v42(n6)p874-882 / 8 refs

Transport energy resources are largely finite, subject to constraints and a major cause of pollution. Transport-energy planning is not currently included in traditional transport and urban planning. However, transport energy is related to both land use and transport systems therefore transport-energy policy has the ability to positively influence urban design. A new tool has been created, the transport energy specification, which is intended for use within existing local government urban planning frameworks. In order to use this tool, a transport-energy limit is first defined by planning authorities that sets a quantifiable design boundary for urban and transport system development. The transport energy specification is then used to ensure development occurs within the defined design boundary. A case study was performed to demonstrate the required process to achieve a transport energy specification for an urban region. Karlsruhe, Germany was selected for the case study and the results showed that a minimal 0.97 MJ of transport energy per person per week was required, the equivalent energy a 60 W light bulb uses in four and a half hours. This was largely due to high residential density, many activities located within the residential area and the ease and safety of active transport (cycling and walking). (A) Reprinted with permission from Elsevier.

## How to plan for regional accessibility

Straatemeier, T

Transport Policy  
Elsevier Science Ltd  
(The Boulevard, Langford Lane, Kidlington,  
Oxford OX5 1GB, United Kingdom)  
2008-03 / v15(n2)p127-137 / 33

In order to address some of the shortcomings of traditional urban transportation planning, it is argued that a shift is needed from planning for mobility to planning for accessibility. Accessibility is a well-known and studied concept within the scientific literature. Its use in practice however is limited. This paper explores the ways of using the concept of accessibility in planning practice, with a special focus on the phase of policy design. Using the Amsterdam Region as an example, it is illustrated how simple accessibility measures can help planners with the design of integrated transport and land-use policies that call for different solutions than the traditional approach. (A) Reprinted with permission from Elsevier.

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## Structural changes in commuters' daily travel: The case of auto and transit commuters in the Osaka metropolitan area of Japan, 1980-2000

Susilo, YO  
Kitamura, R

Transportation Research A  
Elsevier Science Ltd  
(The Boulevard, Langford Lane, Kidlington,  
Oxford, OX5 1GB, United Kingdom)  
2008-01 / v42 (n1) p95-115 / 47 refs  
ISSN: 0965-8564

Structural changes over time in commuters' travel patterns are examined by formulating and estimating simultaneous equations model systems of activity engagement and travel. Results of large-scale household travel surveys conducted in the Osaka metropolitan area of Japan in 1980, 1990 and 2000 are used with matching demographic, land use, and network data. Statistical examinations of the model systems indicate that the structural relationships underlying travel behavior have not been stable over the 20 years. Overall, expanding tendencies in out-of-home activity engagement and travel are exhibited by both auto and transit commuters, but in different ways. The study results challenge the conventional wisdom

that auto travelers tend to chain trips; transit commuters make more stops and chain trips more often than do auto commuters in the Osaka area, suggesting that travel patterns are heavily influenced by transportation networks and land use developments.

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## SITLUM - updating scoping studies

TRL Limited and Strathclyde Partnership for Transport  
(TRL Limited, Crowthorne House, Nine Mile Ride, Wokingham, RG40 3GA, United Kingdom)  
2008

This project contains two scoping studies for SPT. The first of these is to examine the issues related to rezoning the SITLUM land-use transport model to better match the recent rezoning of the TMfS/TELOMS zoning system in Scotland and the new Ayrshire transport model. It includes work on the land-use implications being conducted by David Simmonds Consultancy. The second study relates to the development within the STM transport model of a new station appraisal module and the scoping study will look at the possible approaches to developing the module in the light of the client's expectations.

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## Integration of Parcel-Level Land Use Model and Activity-Based Travel Model

Waddell, P  
Wang, L  
Charlton, B

Conference Title: Transportation Research Board 87th Annual Meeting. Location: Washington. Held: 20080113-20080117  
Transportation Research Board (TRB)  
(2101 Constitution Avenue NW, Washington, DC, 20418, USA)  
2008-00 / 19p / + refs

This paper develops an integrated application of a land use model operating at a parcel level, integrated with an activity-based travel model, and applied in San Francisco, California. The paper describes the specification and estimation of the microsimulation land use model, implemented using UrbanSim and the Open Platform for Urban Simulation (OPUS). In contrast with prior operational modeling applications that have used large zones or gridcells as spatial units of analysis, this application used parcels as the

unit of analysis for real estate development, and buildings as the unit for location of households and businesses. Measures of accessibility are derived from the San Francisco activity-based travel model, and the predicted locations of households and business establishments are used to update the micro-level inputs needed for the activity-based travel model. Data used in the model include business establishments linked to parcels over several years, and a panel of parcels that allow modeling of parcel development over time. This paper describes several advances that have not been previously integrated in an operational model system, including the use of parcels and buildings as units of location for consumers and developers of real estate, the use of business establishments to represent economic activity, and the interfacing of this microsimulation land use model with a microsimulation activity-based travel model. Computational performance and development effort were found to be modest, with run times averaging 20 minutes per year, and the project development and implementation requiring approximately 6 person-months over one year.

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#### **Jurisdictional Control and Network Growth**

Xie, F  
Levinson, DM

Conference Title: Transportation Research Board 87th Annual Meeting. Location: Washington. Held: 20080113-20080117  
Transportation Research Board (TRB)  
(2101 Constitution Avenue NW, Washington, DC, 20418, USA)  
2008-00 / 40p / + refs

Transport infrastructure evolves over time in a complex process as part of a dynamic and open system including travel demand, land use, as well as economic and political initiatives. As transport infrastructure changes, each traveler may adopt a new schedule, frequency, destination, mode, and/or route, and in the long term may change the location of their activities. These new behaviors create demand for a new round of modifications of infrastructure. In the long run, the collective change in the capacity, service, connectivity, and connection patterns (topology) of networks is observed. Exploring the mechanism underlying this dynamic process can answer questions such as how urban networks have developed into various topologies, which networks patterns are more efficient, and whether and how transport engineers, planners, and decision makers can

guide the dynamics of land uses and infrastructure in a desired direction. This paper examines how a fixed set of places incrementally gets connected as transport networks are constructed and upgraded over time. A Simulator Of Network Incremental Connection (SONIC) models these processes and examines how the incremental connections are actually implemented, as well as how networks evolve differently, with regard to connectivity and efficiency, under centralized versus decentralized jurisdictional control. The sensitivity of emergent topologies to some model parameters is also tested.

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#### **Pedestrian environments, transit path choice, and transfer penalties : understanding land-use impacts on transit travel**

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Ferreira, J, Jr

Environment & Planning B  
Pion Limited  
(207 Brondesbury Park, London NW2 5JN, United Kingdom)  
2008-05 / v35(n3) p461-479 / 37 refs  
ISSN: 02658135

This paper investigates the impact of pedestrian environments on walking behavior, and the related choice of travel path for transit riders. Activity logs from trip surveys combined with transit-route and land-use information are used to fit discrete-choice models of how riders choose among multiple paths to downtown destinations. The work illustrates how the quality of pedestrian environments along transit egress paths affects transfers inside a transit system, and how the impedance of transferring affects egress walking path choices. The use of GIS techniques for path-based spatial analysis is key to understanding the impact of pedestrian environments on walking behavior at the street level. The results show that desirable pedestrian environments encourage transit riders to choose paths that are 'friendlier', even if they involve more walking after leaving transit. Policy implications for land-use planning and transit service planning are discussed.

## **Estimating land use impacts on transportation - findings from the Hanover region**

Bohnet, M  
Gutsche, JM

Proceedings of the European Transport Conference 2007 Held 17-19 October 2007, Leiden, the Netherlands  
2007 / 0 refs

Land use decisions can contribute decisively to a more or to a less sustainable mobility. It is shown how commonly-used transportation models, often available in regional or municipal planning or transportation departments, may be used to assess the cost impacts of urban development. This method reveals the high costs associated with non-sustainable location decisions on public and private budgets, supporting the often qualitative discussion on sustainable mobility with quantitative arguments. The influence of the regional land use plan on transportation and the effects of location decisions for shopping and residential developments in different locations on transportation, the effects of regional land use planning on transport patterns, and the effectiveness of the regional land use plan in the Hanover Region different scenarios for the distribution of population, jobs and retail establishments in the year 2020 were studied. A do-nothing scenario, using current trends as a baseline, was compared with scenarios in which development occurs in accordance with, or working against, the regional land use plan. The modelling results show that the implementation of the regional land use plan can reduce the kilometres travelled by car by 12%. Implementation would also maintain the mode share of trips made by foot, bicycle and public transportation. In the implementation scenario, public transport revenues remain stable, whereas in the do-nothing scenario, they are projected to fall by 15%. An analysis of the traffic impact of three retail mall developments in the Hanover Region was conducted regarding their effects on mode choice, kilometres travelled, public transport revenues or on existing retail locations. Results reveal that the impact of new suburban malls can increase or decrease total kilometres travelled depending on the location of the mall. A mall in the city centre, due to its excellent access to public transport, was found to reduce car kilometres travelled, in spite of an increase in total distance travelled. Residential location influences the mobility patterns of people. Suburban locations often provide cheaper housing prices and high quality of open space, but inhabitants

trade off higher costs in time and money spent on mobility than inhabitants in central locations. The analysis shows that households in central locations with attractive mobility options show 50% lower rates of car ownership, even those that are able to afford a second or third car. Thus households in favourable locations were found to travel on average half as many kilometres as their suburban counterparts, and to save more than 50% on mobility costs. In the Hanover region, 16 different residential locations were compared regarding mode choice, distance travelled per mode, and the revenue generated for public transport agencies. Some findings include: commuting trip distances increase heavily with the distance to the city centre; a broad range of shops, schools and leisure facilities next to residential areas tend to reduce non-work trip lengths and increase walking and cycling; residences within transit catchment areas clearly showed reduced car use and lower car kilometres travelled; car ownership is significantly lower in central locations accessible by transit when controlling for socio-demographic and economic factors. This report supports the finding that sustainable urban planning is crucial to lower car dependency, especially in the context of rising petrol prices. The in-depth analysis linking location decisions to transport patterns demonstrates that every land use decision makes a difference in meeting sustainable mobility goals; that is, every individual location decision of a commercial or residential development adds up to success or failure of the strategic plan.

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## **Guidelines for undertaking transport assessments in New Zealand and Australia**

Clark, I  
Faid, M

Australian Institute of Traffic Planning and Management (AITPM) National Conference, 2007, Canberra, ACT, Australia  
Australian Institute of Traffic Planning and Management (AITPM)  
(Po Box 6684, Halifax Street, Adelaide, South Australia, 5000, Australia)  
2007-10 / 61-72 / 15 refs  
ISBN: 0957884095

The Auckland Regional Transport Authority (ARTA) published guidelines on undertaking integrated transport assessments (ITAs) in the Auckland region, in October 2006. These guidelines seek to ensure that adverse transport effects associated with development are avoided or minimised.

This is in contrast to traditional traffic impact assessments, which seek to mitigate the effects and have a natural focus on traffic rather than other transport issues. The development of guidelines is expected to go some way towards ensuring that a transport assessment covers all aspects of the transport system and that developments, structure plans, or plan changes will be integrated with land use planning and that they will pay due regard to all relevant policies. This paper will: 1. set the context regarding the planning and transport situation in Auckland; 2. summarise the contents of the ARTA ITA guidelines; and 3. outline the availability of traffic or transport guidelines throughout Australia, and identify common grounds and inconsistencies. (a)

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### **Travel minimisation and the 'Neighbourhood'**

Curtis, C  
Olaru, D

Proceedings of the European Transport Conference (ETC) 2007 Held 17-19 October 2007, Leiden, the Netherlands  
2007 / 23p / 35 refs

Since the 1940s planners have pursued the notion of the neighbourhood and of self-containment, both aimed at achieving local trip making. It is arguable that transit oriented development is a reincarnation of these ideas. Both concepts appear strongly relevant today in the context of sustainability and travel minimisation. But to what extent do residents actually minimise travel, and what type of resident? Our research investigates the population groups living within three station precincts along a new suburban railway through southern Perth suburbs to Mandurah (Western Australia). We examine the place of travel minimisation (in terms of car-based travel) in the residents decision to locate to the precinct and in the subsequent travel patterns of residents. Using travel diaries we report on the differences by household type, exploring also how the household negotiates travel reduction, and on the differences between work and non-work travel. The paper evaluates the travel impact of different accessibility opportunities ranging from congenial configurations of railway station precincts, containing a variety of shops, services, and other attractions to station precincts acting primarily as origin stations or transit interchanges. We explore the relationship between travel patterns and access to different activity opportunities. Rich factual data about

travel, physical activity, relocation, and valuation of neighbourhood features is complemented by a stated choice experiment on location decision. at accessibility features affect the willingness to use non-motorised travel and conduct more physical activity, and this relation is stronger for residents who appreciate the physical characteristics of their neighbourhood. There are also linkages between residential choice, trip chaining, and the household type. We expect our conclusions to show that where local opportunities are provided people do reduce travel, but that this is tempered by socio-demographic characteristics. This research will provide much needed empirical evidence to support future city planning decisions through the integration of land use and sustainable transport modes.

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### **Jobs closer to home: what does it mean and how to achieve it**

Daniels, R

Australasian Transport Research Forum (ATRF), 30th, 2007, Melbourne, Victoria, Australia, Vol 30  
ETM Group  
(Level 2, 521 Toorak Road, Toorak, Victoria, 3142, Australia)  
2007-09 / 16p / - refs

Despite widespread community and professional recognition and acceptance of the issue, there are many ways to measure and define the concept of jobs closer to home. In NSW, the State Plan measure is the proportion of the population with access to a centre within 30 minutes by public transport, with a range of supporting indicators. The paper discusses the definition and measurement issues using data for Sydney. A central issue is conflict between opportunities for jobs closer to home, and actual behaviour of workers in choosing a job closer to home. Policy initiatives can focus on increasing opportunities for jobs closer to home, but this may not be reflected in actual behaviour. In working towards the objective, planning needs to recognise the different reasons why people may not choose a job close to home. The paper discusses policy approaches to achieving jobs closer to home such as transport improvements, strategic land use planning for housing and job location, work practices and the role of information, and related impacts on other policy objectives such as public transport use and air quality. (a)

**Using structural equations modelling to unravel the influence of land use pattern on travel behaviour of urban adult workers of Puget Sound region**

De Abreu, SJ  
Goulias, KG

Proceedings of the European Transport Conference (ETC) 2007 Held 17-19 October 2007, Leiden, the Netherlands  
2007 / 18p / 33 refs

Since the 1990s a great number of studies attempted to unravel the ways in which land use patterns and urban configuration influence travel behaviour. Since then important methodological advances have been made, namely the wider use of utility based models and the introduction of activities based frameworks, just to name a few. Econometric and statistical advances also enabled the account of more complex correlation structures thus eliminating many biases in the assessment of land use and its reciprocal relationship with travel behaviour. This paper addresses the relations between travel behaviour and land use patterns using a Structural Equations Modelling (SEM) framework. SEM is a multi equation technique which is particularly suited for the study of complex relations, since it allows modelling the effects of land use patterns on travel behaviour while controlling for self selection bias and effects among many endogenous variables. The proposed model structure was developed earlier in a model built for Lisbon (Abreu e Silva, Golob and Goulias, 2006), which concluded for the existence of significant effects of land use patterns in travel behaviour. In that study land use influences travel behaviour in a different way when one considers land use at the home place and the work place separately but in the same model system. This paper continues that research project which aims to compare results from different cities in North America and Europe, using the same modelling framework and comparable databases. The travel behaviour variables included in the model are multidimensional and comprehend both short term and long term mobility decisions. Regarding long term decisions the model includes variables like home location, car ownership levels and transit pass ownership. On the shorter term decisions the variables describe the quantities of mobility by mode (car, transit and soft modes), both in terms of total kilometres travelled and number of trips. The model also includes a trip scheduling variable, which is the total time spent between the first and last trips. The modelled land use variables measure the levels of urban

intensity and density, diversity, both in terms of types of uses and the mix between jobs and inhabitants, the transport supply levels, transit and road infrastructures, and accessibility ratios. The land use patterns are described both at the residence and employment zones of each individual included in the model. This plethora of variables is reduced to a more manageable number of variables using a factor analysis technique. In order to explicitly account for self selection bias the land use variables are explicitly modelled as functions of socioeconomic attributes of individuals and their households. The model results are discussed and compared with the results obtained for Lisbon. Methodological findings are also discussed for the continuation of this study as well as guidelines are presented for other comparative studies in Europe.

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**The effects of railway investments in a polycentric city: a comparison of competitive and segmented land markets**

Debrezion, G  
Rietveld, EPP

Environment & Planning A  
Pion Limited  
(207 Brondesbury Park, NW2 5JN, United Kingdom)  
2007 / v39 (n9) p2048-2067 / 19 refs  
ISSN: 0308-518X

The paper analyzes the effect of railway investment on land prices and land use in a polycentric city under various regulatory regimes of land markets. The introduction of a fast mode of transport (train), accessible in discrete locations, leads to an increase in city size. The stations of the fast mode induce dense residential settlements in their vicinity. As a result, the average residential and commercial land rents increase in both competitive and segmented land-market situations, compared with the unimodal transport case. When rail investments serve only one particular centre, this leads to the growth of the advantaged centre at the expense of the other centre. An investment in the fast mode results in city growth and an increase in rent receipts. However, the effect of the investment for individual centres and their corresponding residential areas depends on the underlying land-market conditions. Restrictions on commercial land use lead to increases in commercial rents, but this is more than offset by the decrease in residential land rents.

**Developing a sub-regional transport strategy for regeneration and growth**

Dobson, A  
Simmonds, D  
Capon, O  
Potter, A  
Ash, A

Proceedings of the European Transport Conference (ETC) 2007 Held 17-19 October 2007, Leiden, the Netherlands  
2007 / 1 ref

The Thames Gateway South Essex area will accommodate 43,000 new homes by 2021 and 55,000 new jobs. As one in seven trips made in 2021 will be a new trip arising from one of these new houses or jobs, this scale of development offers the opportunity to make a step change away from the current transport pattern to something that better serves the objectives for the region. This paper describes how the Thames Gateway South Essex Land Use Transport Interaction Model has been specified and developed such that it can provide a forecast as to how land use and transport use will change based on land use allocation policies, transport investment choices and the prevailing economic conditions. It discusses how this model has been used to examine a series of high level transport strategies for the region, and inform stakeholders the effects of their choices on their regeneration and growth objectives. Work has examined the economic success of a strategy to improve connectivity to London and compared this to a strategy geared to alleviating internal congestion and providing better linkage between the resident population and its jobs. Other tests have evaluated the extent to which the development of good public transport linkage, demand management and road user charging affects inward investment in terms of scale and location. From these tests a shortlist of strategies has been developed against which resilience testing was conducted; does a strategy that provides the best economic growth and regeneration during periods of national growth still offer the best strategy should London and the rest of the UK suffer economic downturn?

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**Rapid Transit as a Catalyst for Reurbanization in Waterloo Region**

Durant, D  
Willoughby, WD

2007 Annual Conference and Exhibition of the Transportation Association of Canada: Transportation - an Economic Enabler  
TAC (Transportation Association of Canada) (2323 St Laurent Boulevard, Ottawa, Ontario, K1G 4J8, Canada)  
2007 / 21p / 8 refs  
ISBN: 1551872528

Waterloo Region is facing many of the same challenges experienced by other rapidly growing communities throughout North America including increasing traffic congestion, outward pressure on urban boundaries, public health concerns and downtowns desperately in need of revitalization. Many of these impacts are directly related to society's dependence on the automobile. Rapid transit is an integral component of Waterloo Region's Regional Growth Management Strategy (RGMS), approved by Regional Council in 2003. Rapid Transit will act as a catalyst for reurbanization bringing together land use planning and transportation infrastructure in an innovative approach to community building. Some of the benefits of rapid transit discussed in this paper include increased modal share brought on by ridership growth with added development around rapid transit stations, reduced urban sprawl and pressure on the urban boundaries, mitigating congestion with policies and resources to control increased traffic in the downtown cores, connections with inter-city transit, minimizing the impact of growth (development and traffic) on climate change and heightening public safety through station area design principles and enhanced security for pedestrians and residents living around stations.

.....

**National scale land-use and transport modelling: the mars Austria model**

Emberger, G  
Pfaffenbichler, P  
Haller, R  
Koelbl, R

Proceedings of the European Transport Conference (ETC) 2007 Held 17-19 October 2007, Leiden, the Netherlands 2007 / 14p / 16 refs

Integrated modelling of transport and land-use is a theoretically and methodologically sound approach implemented in several operational land-use/transport interaction (LUTI) models. However, its application has to date been mainly limited to urban regions. While this is understandable many related problems are most apparent in urban areas, there is no fundamental theoretical or empirical reason to neglect rural areas. Moreover, most operational urban models appear as relatively custom-tailored implementations of generic modelling environments. The resulting questions of generality, including e.g. issues of transferability to other areas, have rarely been studied in depth. We expect that the implementation of a LUTI model on national scale can help to address these issues.es made in the setup of a national land-use/transportation interaction model for Austria (MARS Austria). The model covers the entity of Austria and 121 fairly diverse model zones. Despite this aggregate layout, even relatively small urban agglomerations are differentiated into core and hinterland areas. At the current stage, data from the 1991 and 2001 population are used, but we intend to extend the time series to 1971/81 for extended model testing. Work progress currently does not yet permit to present concluding results in relation to the research questions outlined above, but first tentative conclusions are drawn for the MARS model. We identify two concrete conceptual shortcomings of the model for national scale applications. First, migrations flows are treated in a too aggregate way (pooling of migrants over the case study) and, second, the costs of migration are neglected in the model whereas they play a central role in migration theory. Even though the model results are not satisfying at the moment when compared to observed development, we conclude that implementing LUTI models higher spatial scales does have the potential to raise their generality and theoretical underpinning, which may in the end also benefit urban models.

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**Transport accessibility and local land use decisions: addressing the challenges of implementing metropolitan planning in established urban areas**

Holloway, A

Australian Institute of Traffic Planning and Management (AITPM) National Conference, 2007, Canberra, Act, Australia  
Australian Institute of Traffic Planning and Management (AITPM)  
(Po Box 6684, Halifax Street, Adelaide, South Australia, 5000, Australia)  
2007-10 / 231-43 / 11 refs  
ISBN: 0957884095

Metropolitan plans have been prepared to meet the challenges of sustainable growth and development in major urban areas across Australia over recent years. Each of the plans includes directions, at varying levels, to accommodate dwelling and job growth in established urban areas. This aspiration is closely related to the need for new forms of housing located closer to public transport and services. With many of the obvious old industrial and redundant sites already redeveloped, this represents an ambitious objective, given the policy and planning constraints to redevelopment. Community stress and conflicts are likely unless the redevelopment potential and process is better understood managed effectively. Urban capacity modelling, including accessibility, can assist in understanding the opportunities for redevelopment in established areas. If regional planning objectives are to be achieved, techniques such as this will be an increasingly important in established areas to plan for future housing, jobs and transport access. Lessons from the application of this process in an inner city area in Sydney will be presented in the context of approaches in South East Queensland and Melbourne. Other opportunities to extend the techniques as community engagement and decision making tools will be explored. (a)

.....

**Discriminant Impact of Transit Station Location on Office Rent and Land Value in Seoul: An Application of Spatial Econometrics**

Kim, J

Journal of Transport Economics & Policy  
London School of Economics and University of Bath  
(University of Bath, Claverton Down, BA2 7AY, United Kingdom)  
2007-05 / v41 (n2) p219-245 / 38 refs  
ISSN: 0022-5258

This study examines 731 office properties in Seoul, Korea to determine discriminant impact on office rentals and land values by a transit station's location in the city. Value premiums from better accessibility to stations seem to exist; but they decay with increasing distance from centres and correlate with the development densities of station areas. Research sampled heavily from suburbs may not find the same station benefits as in the denser inner city. Also, this study expands its estimation model to contain errors as well as dependent variables, reducing the spatial autocorrelation and thereby producing a more efficient estimate for transit's impact. (A)

**Access to Destinations: 2007 Conference Proceedings**

Nelson, PP  
Snopl, P  
Becker, MB  
Hammerand, J

Conference Title: Access to Destinations: 2007 Conference Proceedings. Location: Minneapolis. Held: 20070823-20070824  
University of Minnesota, Minneapolis (Institute of Public Affairs, 301 19th Avenue South, Room 130, Minneapolis, MN, 55455-, USA)  
Minnesota Department of Transportation (Transportation Building, 395 John Ireland Boulevard, St Paul, MN, 55155, USA)  
2007-11 / 36p / - refs

This report summarizes the proceedings of the second Access to Destinations conference. The conference provided an opportunity for experts in transportation, urban planning, geography, and public policy to exchange ideas on a broad range of topics related to accessibility in transportation and land use studies. From new methods and tools focused on measuring accessibility, to far-

reaching and candid discussions of the policy implications of new research findings, the 2007 conference showed that accessibility studies are making great strides in academia and in the public discourse on land use and transportation issues. Access to Destinations represents a new way of looking at the complex challenges that characterize transportation and land use in the twenty-first century--including congestion, economic development, transit service, and social equity. The research projects described in this document are characteristic of the work now underway in this diverse interdisciplinary field.

**Evaluating urban transport and land use policies through the use of an accessibility modelling framework**

Primerano, F  
Taylor, MAP

State of Australian Cities National Conference, 2007, Adelaide, South Australia  
University of South Australia  
(, The Levels, South Adelaide, 5095, Australia)  
2007-11 / 12p / 17 refs

This paper discusses a framework used to develop measures of accessibility that take into consideration the travel behaviour of individuals in addition to other factors that are sensitive to transport and urban planning policies. The accessibility framework determines the benefit or need for an individual or group of people to travel to an activity. The framework revolves around a hierarchy of decisions individuals make when deciding to participate in an activity. The behavioural models within the accessibility framework are built from travel information collected through travel diaries that indicate the travel patterns of individuals within households. The framework is activity-based rather than trip-based. The capabilities of the accessibility framework to evaluate transport and land use policies are demonstrated to evaluate the impacts of (1) a major road project and (2) a land use policy (aimed at increasing regional employment opportunities) in metropolitan Adelaide. The results from the accessibility framework show how the impacts of the initiatives are distributed across the metropolitan area. (a)

## Is Compact Growth Good for Air Quality?

Stone, B  
Mednick, AC  
Holloway, T  
Spak, SN

Journal of the American Planning Association  
American Planning Association  
(122 South Michigan Avenue, Suite 1600,  
CHICAGO, IL, 60603-6107, USA)  
2007-00b / v73 (n4) / 404-418 / + refs  
ISSN: 0194-4363

This paper, which is part of a study sponsored by the U.S. Environmental Protection Agency (EPA) on the impact of land use and transportation on future air quality, assesses the effectiveness of compact growth in improving air quality at a geographic scale compatible with secondary pollution formation and transport and over a planning horizon sufficient to capture the longer-term benefits of regional land use change. Future air quality is associated with alternative land development scenarios through the integration of three separate and previously unrelated modeling components. These components consist of a set of standard population projection techniques, a household vehicle travel activity framework, and a mobile source emissions model developed by the EPA. The results suggest that the median elasticity of vehicle travel with respect to density change over time to be -0.35, suggesting metropolitan areas can expect a 10% increase in population density to be associated with a 3.5% reduction in household vehicle travel and emissions. Compactness was associated with greater reductions in vehicle travel than in previous studies, which suggests land use change can play a measurable role in improving regional air quality over time. In addition, vehicle elasticities derived for urban and suburban census tracts across the 11 metro regions suggest density increments within urban zones (-0.43) to be more than twice as effective in reducing vehicle travel and emissions as density increments within suburban zones (-0.19). A comment on this paper appears on pp 418-420 of this issue.

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## Incorporating land use in metropolitan transportation planning

Waddell, P  
Ulfarsson, GF  
Franklin, JP  
Lobb, J

Transportation Research A  
Elsevier Science Ltd  
(The Boulevard, Langford Lane, Kidlington,  
Oxford, OX5 1GB, United Kingdom)  
2007-06 / v41 (n5) p382-410 / 39 refs  
ISSN: 0965-8564

In current practice, very few Metropolitan Planning Agencies attempt to capture the effects of transportation system changes on land use, and the consequent feedback effects on transportation system performance, despite substantial evidence that these effects may be significant. In this paper, we present a case study on the application of UrbanSim, a detailed land use simulation model system, and its integration with a regional travel demand model in the Greater Wasatch Front area of Utah. Like several other metropolitan areas, this region has recently been confronted with legal challenges to proposed highway projects, drawing substantial scrutiny to the land use-transportation connection. We describe the UrbanSim model specification, results from model estimation, and sensitivity analyses conducted with the combined land use and travel model system. The results of the sensitivity analysis suggest that accounting for the land use effects of a regional transportation plan may produce significant shifts in key transportation evaluation measures such as vehicle miles traveled, vehicle hours traveled, and hours of congestion delay. (A) "Reprinted with permission from Elsevier"

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## **Integrating land use and transport planning**

Ward, M  
Dixon, J  
Sadler, B  
Wilson, J

Land Transport New Zealand Research Report  
Land Transport New Zealand  
(Po Box 2840, New Zealand)  
2007 / (n333) / 116p / + refs  
ISBN: 0478287461  
ISSN: 1177-0600

Over the last decade, the integration of land use and transport has gained increasing international attention. This trend has been necessitated by the growing environmental and social impacts of road networks and motor vehicle use. These impacts are widely seen as being exacerbated by a lack of integration between land use and transport planning. This report examines potential legal and institutional barriers to the integration of land use and transport planning in New Zealand. It provides an analysis of key planning instruments and practices in relation to the Resource Management Act 1991, Land Transport Act 1998, Land Transport Management Act 2003 and Local Government Act 2002. It also reviews overseas experience to identify key characteristics of effective integration that support sustainable transport outcomes. Drawing on international experience, recommendations are presented for improving New Zealand's land use and transport planning arrangements to facilitate integration. The research undertaken for the report was carried out between July 2006 and August 2007, as part of Land Transport New Zealand's 2006/2007 Research Programme. (a)

## **Transport impact guidelines for site development: literature review**

Weller, P

Land Transport New Zealand Research Report  
Land Transport New Zealand  
(Po Box 2840, New Zealand)  
2007 / (n327 PART II) / 74p / - refs  
ISBN: 0478287402  
ISSN: 1177-0600

Beca Infrastructure Ltd was commissioned by Land Transport New Zealand to undertake research and prepare a good practice guide for sustainable land use development to be used by all practitioners of transport planning in

New Zealand. Research was undertaken during 2005-2007. The methodology put forward in the guide is intended to be flexible enough to be useful in considering the transport impact of all land-use developments. The research covered the following main areas: comparison of New Zealand and international best practice; consultation on the most appropriate approach for a transport impact assessment (TIA) good practice guide in New Zealand; and methodology flow-chart and checklist. The report summarises the results of a literature search in New Zealand and a wider search of relevant worldwide literature, supplemented by inputs from international experts. The report includes a comparison of best practice in New Zealand and internationally and a qualitative assessment of the pros and cons of each approach. This assessment takes into account the differing statutory requirements and land-use planning issues in the countries whose practices have been compared with those of New Zealand. (a)

## **Rail transit oriented urban development in Dalian: towards a new urban form**

Zhao, S  
Yang, Z

Proceedings of the European Transport Conference (ETC) 2007 Held 17-19 October 2007, Leiden, the Netherlands  
2007 / 17p / 8 refs

China has been experiencing dynamic urbanization and motorization process, under a rapid economic growth. During 1980-2005, the overall GDP increased by approximately 40 times, averaging around 10% growth per annum; the urban population tripled while the total population increased by 30%; the numbers of motor vehicles and motor vehicle drivers increased approximately 18 times and 33 times respectively. As a result, mobility and accessibility are declining rapidly in most of Chinese cities. As one of the pioneers of sustainable urban development in China, Dalian, a Northeast port city, has adopted a strategic policy to enhance rail transit oriented urban development. A comprehensive rail transit plan was formed in the 1990s and updated in 2004. This paper investigates the impacts of Mass Rapid Transit system on urban form. No 3 route which connects downtown and new town concentrated industrial parks and tourism spots is targeted. Impacts in suburban areas such as decentralization (relocation) of population & employment from

downtown areas and development of new town along MRT route were found. The property values & rents were also increasing along the MRT route though this impact is weak at downtown and strong in suburb. It is clear that after more than a decade's construction and operation, the so called one-center-two-axe-three-node urban form is gradually shaped by the MRT system and other related public transportation system. The lessons learnt from Dalian might be attributed to (1) stronger authority and powerful leadership by former mayor and (2) less barriers to new development due to stated owned land use system (Land use right and land development right).

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**Accessibility evaluation: there's more to it than just summing up travel cost reductions**

Zondag, B  
De Jong, G  
De Bok, M  
Geurs, K  
Pieters, M

Proceedings of the European Transport Conference 2007 Held 17-19 October 2007, Leiden, the Netherlands  
2007 / 13 refs

Conventional methods to measure accessibility in cost-benefit analysis are not capable of measuring all accessibility benefits of integrated land-use/transport strategies. Conventional methods are here defined by the frequently applied rule-of-half project appraisal method in combination with changes in travel times (or congestion time). Such an approach is incapable of calculating all the accessibility effects of land-use policies, as it does not value changes in the land-use pattern. The land-use effects are only indirectly valued as they affect travel production or times/costs, which seems to be an implausible approximation for these benefits as it does not address in a direct way changes in the travel opportunities at the locations. It should be noted that current practice is also not fully measuring the impacts of transport policies as land-use effects resulting from such a policy are not valued. This paper first presents an approach to calculate the accessibility effects of integrated land-use and transport strategies. In a second step, these accessibility effects are converted into monetary costs or benefits. The method has been applied within a large-scale policy study to evaluate the accessibility effects of several integrated land-use and transport

strategies in the Netherlands. In the first step the changes in accessibility are calculated by the TIGRIS XL model; an integrated land use and transport model that has been developed for the Transport Research Centre in the Netherlands. The land-use model uses discrete time steps of one year to generate population segmentation and employment figures by zone. The land use model incorporates four components: a demography module, a land-use and real estate market module, a housing market module and a labour market module. Every five years a dynamic integration is made with the National Model System (NMS), the transport model for the Netherlands. The NMS is a discrete choice type of transport model based on micro-economic utility theory. With such a model it is possible to generate a logsum value for each tour, an aggregate value expressing the utility from alternative modes and characteristics of the destination locations. This logsum represents the accessibility impacts of changes in land-use patterns, which is an important advantage of the logsum method compared to conventional project appraisal using travel speeds or costs in combination with the rule-of-half method. A second advantage of the presented framework is that the use of a land-use and transport interaction model makes it possible to extend traditional accessibility indicators by including changes in land-use as a result of the strategy. The logsum change, defined as the difference between the expected utility of a variant and the reference case, represents the change in the consumer surplus. To value the change in consumer surplus (utility), the standard set of values of time used in project appraisal can be used (e.g. from stated preference studies). An alternative valuation method is to use the set of values of time that is implied by the utility coefficients of the NMS itself, which might be preferred for reasons of consistency. However in this study the standard set has been used to make the findings of the logsum approach more comparable with those of the conventional method (that uses the same set of values of time). In the application of TIGRIS XL for the spatial impressions project for the Netherlands Environmental Assessment Agency (MNP) the accessibility impacts of several land-use and transport strategies have been calculated and expressed in monetary terms. These include a retreat variant, which basically means no growth in the Western part of the Netherlands, and an urban concentration variant with a concentrated development in and around existing urban centres. Furthermore several transport strategies have been tested in combination with the urban

concentration variant, such as an infrastructure construction program, a congestion charging strategy or a combination of both. For all strategies the impacts have been calculated by applying the rule-of-half method as well as the logsum method. Preliminary conclusions are that: Land-use policies do have a substantial impact on accessibility measures and should not be ignored in the evaluation; the rule-of-half method is not capable of addressing these effects of land-use policies on accessibility; the application illustrates that the rule-of-half method can result in effects with the wrong sign.

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**A Strategic Approach to Developing Liveable and Sustainable Arterial Corridors in Auckland City, New Zealand**

Bell, G  
Johns, D

Conference Title: ITE 2006 Technical Conference and Exhibit. Location: San Antonio. Held: 20060319-20060322  
Institute of Transportation Engineers (1099 14th Street, NW, Washington, DC, 20005-3438, USA)  
2006-00 / 12p / - refs  
ISBN: 1933452137

In response to new legislation (the LGA 2002 and LTMA 2003) Auckland City Council embarked upon a process of piloting a strategic planning approach towards developing sustainable and liveable arterial transport corridors. The philosophy adopted throughout the project was one of developing liveable corridors connecting liveable communities in support of Auckland's growth management strategy. The pilot project's objective was to develop an integrated and comprehensive approach to corridor management planning and produce a 20-year strategic framework and action plan towards more sustainable forms of development. The East-west corridor runs through the heart of Auckland City, stretching about 9kms from Remuera Road through Greenlane and Balmoral to Western Springs, and passes through a complex array of different and often competing land uses. The 'East-west multi-modal corridor study' seeks to identify, evaluate and decide upon sustainable transport and land use solutions for the corridor by investigating opportunities for multi-modal transport options, travel demand management and associated land use measures. Urban design objectives are an integral part of this process from project inception through to

implementation in providing for peoples and communities social, economic, environmental and cultural well-being.

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**A Strategic Approach to Developing Liveable and Sustainable Arterial Corridors in Auckland City, New Zealand**

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## **The influence of urban land-use on non-motorised transport casualties**

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Metcalf, AV  
Wedagama, DMP

Accident Analysis & Prevention  
Elsevier Science Ltd  
(The Boulevard, Langford Lane, Kidlington,  
Oxford, OX5 1GB, United Kingdom)  
2006-11 / v38(n6) p1049-1057 / 15 refs  
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The relationship between non-motorised road traffic casualties and land-use was investigated in two zones of approximately 8 km<sup>2</sup> in Newcastle upon Tyne, England. Road traffic accidents are, more usually, analysed in relation to traffic flow, on the assumption that the latter can be derived from land-use data. Here, a direct relationship between primary functional land-use and non-motorised casualties is estimated. We review past work in this area. A shortcoming of casualty data is that it does not record the origin and destination of the journeys being undertaken when the accident occurred. A method was established to identify zones within which most accidents could reasonably be expected to be related to the land-uses within that zone. Generalised linear models were developed using non-motorised casualties as the response variable, with primary functional land-use, population density and junction density as explanatory variables. Separate models were constructed for each combination of cyclists and pedestrians, adults and children, working and non-working hours in city centre and suburban analysis zones. In general, the study found that pedestrian casualties in the city centre zone are particularly associated with an increase in retail and community land-use during working hours. In the city centre zone, out of working hours, an increase in retail land-use (almost certainly clubs and bars) is also associated with an increase in pedestrian casualties. An increase in cyclist casualties during working hours (in the non-pedestrianised area) is associated with an increase in retail land-use. (A) "Reprinted with permission from Elsevier".

## **Getting the balance right: balancing the competing needs for funding for roads and public transport infrastructure in Australia**

Brooker, T

Australasian Transport Research Forum (ATRF),  
29th, 2006, Gold Coast, Queensland, Australia,  
Vol 29  
Queensland Transport  
(GPO Box 1412, Brisbane, Queensland, 4001,  
Australia)  
2006-09 / 14p / 11 refs  
ISBN: 1877040568

The history of urban development in Australia over the past 60 years since 1945 has seen a continuous and progressive increase in the amount of car travel, twenty-fold from a level of 10 billion passenger kilometres per annum in 1945 to approximately 200 billion passenger kilometres now. In contrast the growth in passenger kilometres of travel by urban public transport has been virtually static over the same period, remaining close to 10 billion passenger kilometres per annum throughout the period from 1945-2000. During this period, all levels of government and urban populations have been content to develop vast tracts of our cities with car based land use patterns and little or no access to convenient, fast or reliable public transport services. The private motor vehicle has been seen as bringing the major benefit of personal freedom to the great majority of the population. Despite the environmental sustainability concerns raised throughout the 1980's and 1990's, it is only now with increasing global fuel prices that car dependence is being seen as a potential concern for the future in terms of the high personal costs for car travel that result from dispersed low density urban land use settlement patterns. (a)

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## **Alternative Approaches to Modeling the Travel-Demand Impacts of Smart Growth**

Cervero, R

Journal of the American Planning Association  
American Planning Association  
(122 South Michigan Avenue, Suite 1600,  
CHICAGO, IL, 60603-6107, USA)  
2006-00 / v72 (n3) / 285-295 / + refs  
ISSN: 0194-4363

Although planners have often used traditional four-step travel demand forecasting models to

estimate the travel impacts of smart growth, they are not really appropriate for estimating the travel impacts of neighborhood-scale projects or development near transit stops. This article presents some alternatives to traditional modeling of neighborhood-scale transportation projects, including the direct (or off-line) modeling approach. Examples are presented of direct modeling of rail and transit-oriented land use proposals for the Charlotte, North Carolina metropolitan area, the San Francisco Bay Area, and south St. Louis County in Missouri. Results indicate that concentrating development near rail stations produced an appreciable jump in ridership. These applications also demonstrate that the alternative modeling approaches are well-suited for producing orders-of-magnitude estimates of the travel demand effects of smart growth scenarios and are useful supplements to traditional four-step models.

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### **Issues in Transportation Planning - the Singapore Experience**

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Foong, KW

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Indianapolis, IN, 46226-, USA)  
2006-00 / 127-158 / - refs  
ISBN: 185312799X

Singapore can be considered as one of the few Asian cities to be successful in urban transport planning and management. It has introduced several far-reaching vehicle-restraint policies, such as the vehicle quota system, the electronic road pricing scheme and a high vehicle tax structure, all of which have been effective in relieving traffic congestion on the roads. Recognizing that these restraint policies must be complemented by a good public transport and transportation management system, the Singapore Government has, in the past two decades, embarked on several ambitious programs to introduce intelligent systems into its transportation operations as well as to develop an efficient urban rail network. These decisions are in line with Singapore's long-term transportation plan to integrate land use and transportation planning, to develop a comprehensive road network, to manage car population and road usage, and to provide quality public transport for its people. This chapter discusses the issues related to urban transportation planning in Singapore, with the attention of drawing out the lessons learned from its experience.

### **Large Real Estate Developments, Spatial Uncertainty and Integrated Land Use and Transportation Modeling**

Clay, MJ  
Johnston, RA

Transportation Planning & Technology  
Routledge Journals  
(4 Park Square, Milton Park, Abingdon,  
Oxfordshire, OX14 4RN, United Kingdom)  
2006-12 / v29(n6) p427-444 / 23 refs  
ISSN: 0308-1060

In the past 10 years, integrated land use and transportation modeling has received considerable attention in the scholarly literature. This academic interest is slowly yielding practical applications. In the USA, many metropolitan planning organizations (MPOs) and state departments of transportation are beginning to implement these types of model for the first time. While many improvements have been made to these models, and the value of these improvements should not be understated, much work still remains. One of the most challenging problems in land use modeling is how floorspace (buildings) is built and occupied. The purpose of this article is twofold: first, to draw attention to insufficiencies in the representation of floorspace developer behavior-particularly as it applies to large, urban-edge projects – within current integrated land use and transportation models and, second, to determine the necessity of explicitly accounting for such projects within these models. The Sacramento MEPLAN model will be used together with historical development records to demonstrate and test these assertions. Single large developments are modeled with a common year of development, size, and location. Among the findings, large developments are fairly common in the Sacramento region and make up a considerable amount of floorspace development in absolute terms, large basic sector developments have more of an impact and are therefore more important to explicitly account for than are large non-basic sector developments. A single large basic sector development modeled in a 20-year forecast has a significant impact on zonal outputs. Recommendations are put forward regarding the use of this research in practical modeling exercises. (A)

## **Modelling land use in the Generic Urban Model**

De Bok, M  
Zondag, B  
Petersen, E

Proceedings of the European Transport Conference (ETC) 2006, September 2006, Strasbourg, France  
London Association for European Transport 2006 / 15p / 15 refs

Land-use and transport interaction models are appropriate instruments to forecast land-use responses to transport change. Such models are dynamic in structure, and iterate between transport and land-use components to model how the system evolves over time. This research presents the development of a land use component of the Generic Urban Models (GUM) Phase 2 project, sponsored by the UK Department for Transport. The land use component is part of a forecasting model for the Leicestershire region in the UK. Besides the application of the model for the Leicestershire County Council, the generalised approach can be used by the UK Department for Transport to test impacts of transport policies and exogenous developments on larger urban areas throughout Great Britain. The land use component is based on the TIGRIS XL model, an integrated land use and transport model that has been developed for the Transport Research Centre in the Netherlands. The land-use model uses discrete time steps of one year to generate population segmentation and employment figures by zone. A dynamic integration is made with the Central Leicestershire Transport Model every 5 years. The land use model incorporates four specific land-use components: a demography module, a land-use and real estate market module, a housing market module and a labour market module. In the application of the model to the Leicestershire case study, data from various sources has been used. The base year data are derived from the UK Census, Inter Departmental Business Register (IDBR) and National Travel Survey (NTS). Exogenous scenario inputs are taken from the Office for National Statistics (ONS) Population Statistics and the TEMPRO database. The household and employment location coefficients are taken from estimations on extensive Dutch datasets. These coefficients will be verified with the available UK data. Further developments could include the estimation of new coefficients for the UK. The presented modelling approach provides consistent forecasts of the spatial distribution of residents and jobs, tailored to the needs

of the transport model. In practice, bringing together the land use and transport models will contribute to the ex ante analysis of policy packages targeting at sustainable development. As the EC fifth framework project PROPOLIS has indicated that policy packages combining infrastructure and zoning policies are much more efficient than individual measures. The GUM model is well suited to evaluate such integrated policy packages, particularly because green field and brown field developments are explicitly accounted for within the land use model component.

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## **A sustainability/ accessibility metric for transport and land use decision making**

Doust, K

Conference of Australian Institutes of Transport Research (CAITR), 28th, 2006, Sydney, New South Wales, Australia  
Monash University (Institute of Transport Studies)  
(Building 60, Monash University, Clayton, Victoria, 3800, Australia)  
2006-12 / 7p / 3 refs

Community expectations have moved on from the past transport planning paradigms of only capacity, travel time and pricing. Communities in Sydney are representative of many urban communities around the world by being ahead of policy makers when it comes to shifting expectations. Measuring sustainability in a meaningful way continues to be a challenge for transport planners. Accessibility is opportunity to work and relate with others and is a measure of intra generational equity. It has some similar traits to those of sustainability, but also some tensions. For example, the intergenerational change in accessibility is one aspect of sustainability. (a)

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