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Note that abstracts are ordered alphabetically by title, ignoring the articles “A”, “An” and “The” and prepositions like “On”.

Acceptability and Adoption of Pay-As-You-Drive Vehicle Insurance: the Role of Privacy Concerns

J.W.Bolderdijk, E.M.Steg

Keywords: Pay-as-you-drive, privacy, insurance, monitoring

Pay-As-You-Drive Vehicle Insurance implies that car owners pay premium according to the 'pay as you go' principle: the more kilometers they drive, the more insurance premium they pay. There are multiple vehicle monitoring techniques available for this purpose. GPS technology is currently gaining popularity as a means of monitoring driving behavior. Drivers may however be reluctant to accept and adopt Pay-As-You-Drive Vehicle Insurance policies that rely on GPS monitoring, fearing that extensive registration of their driving behavior will invade their sense of privacy. The current research attempts to clarify 1) to which extent GPS monitoring triggers privacy concerns, and 2) how these privacy concerns affect acceptability and adoption of Pay-As-You-Drive Vehicle Insurance.

The Analysis of Anticipating Departures and the Value of Implied Schedule Delay for Railway Passengers

Yin Yen Tseng, Erik Verhoef, Piet Rietveld

Departure time choice is an important element in travelers' decision making, and it becomes more complicated when the travel time is unreliable. As the degree of travel time unreliability increases, travelers can be expected to shift their departure times to earlier hours to compensate for the increased probability of being late. How early a traveler would shift his departure schedule depends on how he makes tradeoffs among early arrivals, late arrivals, and travel time, for uncertain travel times.

In the present paper, we refer to the behavior of taking an earlier than strictly necessary train connection as "anticipating departure". A simple model is developed to describe and predict railway passengers' anticipating departure time behavior given their preferred arrival times. Furthermore, we derive the expected schedule delay costs with and without considering this anticipating

departures behavior for some specific (two mass-points) travel time distributions. The values of implied schedule delay can then be related to the standard deviation of travel time distribution.

Behavioural aspects of PAYD

Jasper Knockaert

Pay as you drive (PAYD) is a form of road pricing that focuses on differentiating the insurance cost in order to better match the actual risk of driving a car. It is well known that this risk is closely related to driver behaviour, both through the annual distance driven as well as through other behavioural dimensions such as speed, time of day, etc. The traditional annual insurance fee largely fails to reflect these behavioural variations.

As technological possibilities to monitor car driver behaviour in great detail become available, insurers get interested in the possibilities to stimulate drivers to change their behaviour such as to result in a reduction of insurance claims. But there is also a potential general welfare improvement to be expected when marginal transport costs better match (external) damage costs.

In order to study behavioural reactions to a differentiated PAYD insurance scheme, an experiment was conducted in the Netherlands. The experiment involved about 150 car drivers with a high risk profile (age<26y). Their cars were fitted with a technical device to register driving behaviour, and a pricing scheme was presented. The scheme reflected distance driven, actual speed (compared to legal speed using a speed map) and time of day.

Upfront the experiment, normal driving behaviour was registered and each participant was presented with a customised pricing scheme. The experimental dataset was further completed with a number of surveys including a stated choice experiment.

The paper presents first results of the experiment and discusses the behavioural aspects of differentiated insurance pricing in a real world setting.

Biases in Willingness-To-Pay Measures from Multinomial Logit Estimates due to Unobserved Heterogeneity

Vincent van den Berg, Eric Kroes and Erik Verhoef

Keywords: Discrete Choice, Biases in WTP Estimates from Multinomial Logit, Correlated Heterogeneous Marginal Utilities, Omitted Variable Bias

It is a common finding in empirical discrete choice studies that the estimated mean relative values of the coefficients (i.e. the WTP's) from multinomial logit (MNL) estimations are different than those from mixed logit estimations, where the mixed logit has the better statistical fit. However, it is less clear under exactly which circumstances such differences arise. Possible sources of bias in MNL estimates are endogenous explanatory variables and, when using panel data, dynamics in both the unobserved and observed parts of utility. We discuss a number of cases where such an endogeneity problem can occur and argue that the endogeneity problem might be more common in discrete choice studies than is commonly thought. We reproduce the known result from earlier Monte Carlo studies, that random heterogeneity in the marginal utilities in itself does not cause biased MNL estimates. We use datasets created by simulation to test in a controlled environment the effect of the different possible sources of bias on the accuracy of WTP's estimated by MNL. We find that if two heterogeneous marginal utilities are correlated with each other, then this can cause the WTP's from MNL to be biased.

Car Use, Car Ownership, and Quality Choice

Jan Rouwendal

Keywords: car ownership, car use, car quality

This paper develops a micro-economic model of ownership and use of cars by households. It starts with an analysis of car use in a household with two different cars and different (linear) demand functions for kilometers driven by these cars. The next step is the introduction of the ownership decision, while taking car characteristics as given. In particular, we derive the regimes under which households will decide to own two cars, one car or no car at all for given values of the fixed and variable costs of the two cars. We continue with the incorporation of car quality choice into the model. A higher quality increases the marginal utility of car use, but also implies higher fixed as well as variable costs. Depending on its

tastes, the household chooses one or two cars from the available set of quality/cost combinations. If two cars are chosen, they usually differ in quality. Finally, we discuss income effects and the generalization to a multidimensional concept of car quality.

The Circular City with Heterogeneous Firms

Marco Alderighi and Claudio Piga

Keywords: localised competition; cost asymmetry; entry

While the implications of introducing cost heterogeneity in the Hotelling linear city model have been amply investigated in the literature, the Salop (1979)'s circular city model is generally studied by assuming firms with identical marginal costs. In this paper we provide a more in-depth understanding of firms' price setting behaviour in the Salop's model, by allowing any generic number of firms to differ in their efficiency levels. Our analytical solution of the equilibrium prices confirms the intuitions put forward in Syverson (2001) that prices should be a weighted average of all the firms's costs, that weights should decrease with distance and should sum to one. Such properties are not imposed on the solution but constitute its intrinsic characteristics. Weights are also found to be independent of the cost differential between a pairs of firms. The main thrust of the paper is thus the characterization of a highly tractable analytical solution for the equilibrium prices which is valid for any number of firms and any distribution of costs. We also find that the long-run number of firms under a free-entry condition increases with the heterogeneity in firms' costs; relative to the symmetric costs situation, we also find that there is less excessive entry when firms are allowed to differ in their production costs.

Congestion in the Dutch Randstad

Jan Rouwendal, Erik Verhoef and Jasper Knockaert

Keywords: congestion, bottleneck model, calibration

In this paper we consider commuter traffic on the highway corridor Zoetermeer-The Hague in the Dutch Randstad during the morning rush hour. Our analysis focuses on the application of Vickrey's bottleneck model to the data collected by means of detectors on the A12 highway. We find that the standard bottleneck model fits important aspects of the data and compute the implied optimal and coarse tolls.

A Demand-based Methodology for Planning the Bus Network of a Small-medium Sized Town

Salvatore Amoroso, Marco Migliore, Mario Catalano, Fabio Galatioto

Keywords: urban public transport network design, bus system in small-medium sized towns, urban public transport demand modelling, flexible forms of public transport for "weak demand" areas

This work aims at developing a demand-based methodology for designing the bus network of a small-medium sized town. The proposed modelling tool adopts a multi-agent objective function expressing the interests of diverse stakeholders: increase in the surplus of travellers (car and bus users); rise in revenues and decrease in running costs for the bus service provider; reduction in external costs for the local community. This approach has been applied for optimizing a real bus network, that is the one serving Trapani city, a medium sized town in Sicily (West side), with 100.000 inhabitants and a not very competitive public transport system: in fact, only the 5% of journey-to-work trips inside Trapani occur by bus (source: National Institute of Statistics). The analysis has been carried out under two planning scenarios: a short-term one characterized by a budget constraint (no change for the availability of drivers and vehicles) and a long-term one implying the possibility of new investments. In both cases, it has been considered the impact of the park-pricing project recently launched by the local administrators. Moreover, the authors have addressed the challenging problem of serving the various suburban areas of Trapani, characterized by a "weak" demand for the bus service, with innovative and flexible forms of public transport.

As decision variables for the optimization procedure, the following ones have been selected: route, service frequency and service capacity for each bus line. To forecast the mode choices for trips within Trapani, a random utility model has

been employed; the travel demand-urban transport supply assignment problem has been solved by the DUE technique, for private transport, and the hyperpath algorithm, for public one.

Design Rules Applied to Road User Charging Schemes

James Warren, P. Ieromonachou

Keywords: road user charging, design, diffusion theory, universal rules, user-centred design

Road user charging research has been gaining momentum this decade since the implementation of major schemes in London and Stockholm. Other countries in Europe are viewing road user charge (RUC) schemes as more prominent measures that can be used by transport planners to combat congestion or other externalities. This study aims to provide design rules and related considerations for those involved in implementing charging schemes. The question is 'how do we design acceptable charging systems?'

The design of future RUC schemes is discussed and scrutinized for any inadequacies, based on lessons learned from schemes already in place. RUC schemes are treated as a new form of technology and diffusion theory is applied from a design viewpoint. The five main parameters of diffusion are contrasted against both the users' requirements, as well as some of the typical scheme components. Each sub-component can be examined for design worthiness against a parameter or criteria. The five key user centred parameters borrowed from diffusion theory are: the relative advantage, the compatibility, the complexity, the trialability, and the observability. Risks are also considered to a limited extent. Typical issues in a scheme include: the use of revenues, scheme objectives and timing to implementation. Other elements reviewed include scheme champions, communications, openness (or trust), scheme design and privacy of users.

By considering the 'do's' and 'don'ts' of charging schemes, the paper provides a design framework in which such information can be categorised and then assessed according to set parameters. Further to this, and where appropriate, universal design rules are applied to the various elements which can be typically

found in road charging schemes. These rules help shape the scheme to be more user-centred thus making it more acceptable during the implementation phase. This study could also allow those involved in transport to consider scheme selection from a designer's perspective.

The Dynamics of Domestic and International Infrastructure Investments

Marco Alderighi

Keywords: Infrastructure; Public policies; Dynamic games

This paper analyses the optimal investment policy in domestic and international infrastructure through a model of competition among countries. The framework provided by Martin and Rogers [Martin, P. and Rogers, C., 1995, Industrial location and public infrastructure, *Journal of International Economics*, 39, 335-51.] is here extended to include dynamic aspects. The optimal investment trajectories are characterized in two situations: first, when coordination among countries is reached and second when countries behave egoistically. Since international infrastructure produces positive externalities, it emerges that the second situation is sub-optimal.

The Ecopass System in Milan: Theoretical Reflections and Preliminary Evaluations

Edoardo Marcucci, Romeo Danielis, Lucia Rotaris

Keywords: external costs internalization, policy coherence, environmental charging mechanisms

Problems arising from transport related activities in modern cities are progressively attracting greater attention both within the general public as well as among local public administrators throughout the world. Atmospheric pollution, congestion, acoustic pollution, visual intrusion are among the relevant negative impacts generated by city traffic. The external costs produced by vehicular traffic and their internalization policies is a highly debated and relevant issue in Europe.

Local administrators have adopted a wide array of different policies in order to tackle these problems. Policy interventions, with different motivations and objectives at their base, have been aimed at: infrastructure building, infrastructure management, technology innovation and regulation. The various objectives pursued include: congestion reduction, traffic calming, environmental impact reduction, health impact reduction, life quality improvements, historical building protection, etc.

The Ecopass system adopted in the city of Milan, among the most recent policy intervention in this field, has provoked numerous and heated public debates in Italy. The Ecopass system was finally implemented in January 2008 and implies the payment of a flat cordon charge for access the metropolitan area within the Bastions ring delimited by 43 access points electronically surveilled by cameras. The cordon charge is differentiated by: type of vehicle (Euro emission standard), place of residence of the driver (within or out of the restricted zone). A frequent user discount is also available. The specific policy intervention is also accompanied by a temporary access ban to all pre-Euro vehicles as well as to all the Euro1 diesel cars.

The peculiarities of the Ecopass system adopted in Milan, when compared to other policy interventions implemented in other cities (London, Stockholm, Singapore, etc.), are the following: congestion reduction more than environmental impact curtailment, fixed/variable cordon tax differentiated by vehicle type, time windows access allowances, frequent access policy, place of residence of the driver.

The paper provides a theoretical framework for the benchmarking and evaluation of the pros and cons of the specific structuring of the Ecopass system in Milan. The benchmarking of the Ecopass system will be done by comparing the Ecopass system and the other relevant experiences in the world. The evaluation of the intervention will be performed by confronting the objectives declared by the local administrators and the instruments adopted to pursue them. The evaluation will be expressed in terms of coherence between instruments and objectives. Other relevant analysis performed relate to efficiency, effectiveness, political acceptability, equity and duplicability of the experience in a different context in the short and long period both in an ex-ante and ex-post perspective.

The Effect of Travel Time Reliability on Choice Behavior in the Door-to-door Rail Trip

Martijn Brons and Piet Rietveld

Keywords: rail transport, travel time reliability, travel choice behavior

According to the valuation literature in the field of transport, the reliability of travel time is an important aspect of transport quality for the public transport traveler. Low reliability of public transport systems decreases customer satisfaction and thus results in a decrease in public transport mobility. Compared to quality aspects such as the mean travel time and service, travel time reliability has received relatively little attention in the literature.

Traveler's choice behavior is based on the perceived quality of the door-to-door trip instead of only on the quality of the main mode. In this paper we focus on the door-to-door rail trip which, in addition to the rail trip itself, consists of access/egress time and transfer time. Based on dutch data we perform a detailed statistical analysis into the linkages between the travel time reliability on various aspects of choice behavior of the traveler in various segments of the door-to-door rail trip. We use a combination of binary logit models and nested logit models in order to estimate the effect of various measures of travel time reliability on the choice whether or not the traveler will use the train, and if so, which departure and destination station he will choose, and which access and mode will be used. In doing so, we account for various individual and transport-behavioral characteristics in order to analyze differences between groups of rail passengers.

The Efficiency of European Airports: Do the Importance in the EU Network and the Intensity of Competition Matter?

Paolo Malighetti, Gianmaria Martini, Stefano Paleari, Renato Redondi

Keywords: air transportation, efficiency, connectivity, airports' competition

In this paper we study the efficiency of European airports by applying a DEA model to 57 airports. The sample covers 95% of all the airports with a traffic of at

least 5 millions passengers (yearly). We find that largest airports (with more than 10 millions passengers) are more efficient, while airports classified by the European Commission as national have spare capacity and should improve their performances. Largest airports have decreasing returns to scale, while national ones will get a reduction in their average costs if they increase their size of operation. Moreover we investigated the determinants of the estimated efficiency scores. The Tobit regression shows that efficiency is positively related with airport's connectivity index in the European network (i.e. airports with better connections at the network are more efficient) and with the intensity of competition between airports (i.e. airports with nearby competitors on several destinations tend to be more efficient). These results imply that policy makers (in regulating airports' fares and subsidizing development plans) and managers (in evaluating their assets utilization) should take into account that a well connected destinations map and the presence of indirect competition coming from other airports can improve the performances in the management of European airports.

An Empirical Agent-based Model of Parking Behaviour

Karel Spitaels, Sven Maerivoet

Keywords: parking strategy, agent-based modelling

Today, many cities are faced with parking problems, which are only expected to become worse. Such problems cause additional excess congestion, emissions, noise and the use of scarce land. Yet, scientific interest in this issue has been intermittent. There exists little empirical and theoretical knowledge on the parking behaviour of the drivers. However this knowledge is essential in order to estimate economic, social and environmental impacts of new or changing parking policies in a city.

In this paper we develop the microscopic, agent-based simulation model SUSTAPARK (SUSTAINable PARKing). At its core is a heuristic model of the parking behaviour of drivers. The model is based on a decision tree representing the strategic decisions taken by the drivers.

The decision model captures reactions of the drivers to changes in the time available to them and to the local situation on the road. The model also takes into account the individual preferences of the drivers. Their main strategic decisions include aspects such as the choice between an on-street or off-street parking place, as well as choices like 'I will make another lap around this block' or 'I will now look in the next side street'.

The decision rules are constructed with a parsimonious set of variables, including the willingness to pay and the willingness to cheat. The model is calibrated on the unique dataset that was collected during observations of the drivers looking to park in actual traffic situations. The constructed model can be used to formulate parking management strategies that optimise the overall search time for and the use of parking places.

Environmental Equilibrium Assignment

Borja Beltran, Stefano Carrese

Keywords: traffic assignment, toll problems, traffic emissions, bi-level problems

Since the environmental impacts of transport systems are increasing, more attention has to be given to sustainable mobility in the transport planning policies of both at the urban and extra-urban level. The sustainable mobility policies are aimed at improving the system without interfering with the normal activities. The Environmentally Sustainable Transportation (EST) should not damage public health and ecosystem and matched the specification of accessibility. In the international outlook, several examples are available on planning transportation and extraordinary measures of traffic management have been applied focused on the reduction of the emissions.

Despite all studies dealing with sustainability, there seems to be a lack of mathematical programming models to identify optimal strategies or policies. This research proposes models and conventional mathematical programs in order to solve classical transportation problems such as optimal toll problems or traffic assignment and useful to approach environmental problems in urban realities.

In our research we have proposed a bi-level structure for several optimization models and a set of algorithms to solve them. The contribution of the research is

the possibility of integrating emission measurements of pollutants through a transportation network. The upper level problem of bi-level defines the decisions of transportation network manager who tries to optimize the transportation network, whereas the lower problem represent the user's decisions that seek to minimize their total travel costs. The objective is to minimize the total emissions of transportation network, where users choice their routes according to an user optimum equilibrium.

We have performed a computational effort with state of art solvers to find a solution on a test network to solve traffic user equilibrium and bi-level problem. Models have been run in Matlab environment and integrated in the commercial transportation planning software TransCad, in order to make model's application easier and more profitable to planners.

The research has proposed a model that allows easily to test optimal toll calculation based on network emissions aimed at reducing impacts through the network. The results show the potentiality of the models to assess transport strategies, demand policies and possible application of this approach for solving other transportation related problems.

The research ends with a discussion of solutions obtained and related approach as well as an interpretation of the results.

Equity and Efficiency Impacts of Transportation Improvements in a System of Cities Characterized by a Core-Periphery Structure

Eran Leck, Shlomo Bekhor, Daniel Gat

Keywords: Transportation improvements, equity, efficiency, discrete choice modeling, production function, general equilibrium

In recent years there is a growing interest in the mechanisms linking a barrier-free geography and economic efficiency and equity. A common claim put forward by many urban economists, transportation planners and regional scientists is that transportation improvements extend the borders of labor markets, thus contributing to enhanced welfare by widening the scope of opportunities for consumers and producers alike.

This research deals with the contributions of transportation improvements to the generation of economic welfare within a system of cities characterized by a core-periphery structure. A particular emphasis is put on two regions known for their acute socio-economic contrast: the affluent core region of Tel – Aviv and the poor Greater Beer-Sheva Region in the southern part of the country. The study encompasses 101 cities in Israel, and the main data source was extracted from the 1995 National Census.

The main research hypothesis is that transportation improvements will lead to wage convergence between core and peripheral cities and contribute to higher levels of output and productivity in the periphery. The methodological framework chosen to investigate these impacts on the Israeli space economy is a welfare economic model based on three sub-models – a commuting model, a production model and a general equilibrium model.

The commuting model is based on discrete choice methods and deals with the supply side of the labor market. The model's main aim is to explain and forecast the impact of transportation improvements on economic equity measures such as narrowing wage gaps between cities. The purpose of the production model, dealing with the demand side of the labor market, is to explain and forecast the impact of transportation improvements on economic efficiency measures such as increased productivity and output. The general equilibrium model re-balances the labor supply and labor demand components of the commuting and production models, when changes are being made in the transportation system. The model uses an algorithm based on penalty methods to converge and re-equilibrate labor supply and demand. The outputs of the general equilibrium model generated after numerous iterations include wages, employment, productivity, total output and output per worker.

The estimation results of the commuting and production models support the main research question regarding a positive and significant link between decreasing spatial friction and enhanced welfare. Following the estimation and calibration of the models, policy simulations are presented in the paper. The simulations illustrate the effect of diminishing spatial friction on economic equity and efficiency indicators. The paper presents selected results of two policy simulations: highway improvements and introduction of rail service in underserved cities.

The results of the simulations show that the introduction of rail service in underserved peripheral cities is expected to lead to substantial convergence in wages (4%-6%) between southern peripheral towns and core cities. Productivity

growth as a result of linking the southern towns to the national rail system was estimated between 4.5% and 8.5%. Elasticities of output with respect to auto travel time improvements in southern peripheral towns were estimated at the 0.13-0.25 range.

Estimation of Hub Sustainability

J. Veldhuis, J. Zuidberg

Keywords: selectivity problem, hub carrier, reduction of hub sustainability

Several airports in the world are or will be in the short term confronted with capacity problems. As a result of this congestion, many airports will face a selectivity problem: which traffic segments must be accommodated and which segments are less crucial? At hub airports there is generally one (dominant) hub carrier. In case a particular route of a hub carrier will not be accommodated anymore, this may have negative effects on other routes in the same network: routes which are normally fed by the ceased operation will experience a loss of passengers. This phenomenon can be indicated as “reduction of hub sustainability”. To quantify the effect of ‘reduction of hub sustainability’, SEO/AEE has developed a model, which determines the revenues loss in a hub carrier’s network in case one single route of that specific hub carrier will not be accommodated anymore. The model assumes that the hub carrier has nevertheless three instruments to mitigate the described negative effects, which they are able to use to increase their load factors and thus keep routes profitable: ticket price, flight frequency and aircraft size.

Exact and Approximate Pareto-Improving Congestion Tolls

Siriphong Lawphongpanich, Yafeng Yin

Keywords: Congestion tolls, Pareto Improving, Equilibrium

Congestion tolls are considered to be Pareto-improving if they lead to an improvement in travel delay or social benefit and ensure that no user is worse off

when compared to the situation without any tolling intervention. If users are allowed to be slightly worse-off, then tolls are approximately Pareto-improving. The problem of finding Pareto-improving tolls (exact or approximate) can be formulated as a mathematical program with complementarity constraints, a class of optimization problems difficult to solve. Using concepts from manifold suboptimization, we propose a new algorithm that converges to a strongly stationary solution in a finite number of iterations. Numerical results from Sioux Falls and Hull networks suggests that exact Pareto-improving tolls are relative prevalent and the approximate ones can lead to significant improvements in travel delay and social benefit.

Financing Constraints in the Bottleneck Model

André de Palma, Stef Proot and Saskia van der Loo

Keywords: financing, network, investments, congestion

In many countries there is an increasing need for road infrastructure while government investment budgets are limited. The scope of the paper is to better understand the growth of a transportation network when it operates under self-financing constraints. We assume that the operator in charge of the construction of new infrastructures cannot borrow on the capital market, instead he has to finance extensions by toll revenues. Under such restrictions, what type of capacity development can we expect on a single link? What is the impact of the initial conditions (i.e. the configuration of the initial network) on the future network growth and how do erroneous decisions, made at the initial stage, propagate over time?

We examine these questions in a simple multi-period bottleneck model with one link and compare the effects of different types of tolling.

Formulation of Simultaneous Car and Public Transport Network Equilibrium in the Form of Mixed Complementarity Problem in the Context of Bi-level Programming

Olga Ivanova

Keywords: infrastructure investments, network design problem, network equilibrium, mixed complementarity problem

This paper presents a new formulation of simultaneous network equilibrium for car and for public transport in the form of single Mixed Complementarity Problem. This formulation makes it possible to implement network equilibrium without use of special transport packages as well as to incorporate it into the bi-level programming framework, with the help of which one may evaluate welfare benefits of large number of infrastructure project combinations during reasonable amounts of time and allocate network investments in the most efficient way. The paper also traces relationship between functional form of social welfare measure and ordering of infrastructure project combinations using Oslo/Akershus case-studio.

Imbalance in Trade Flows as a Determinant of Transport Prices in a Spatial Network

Olaf Jonkeren, Erhan Demirel, Jos van Ommeren, Piet Rietveld

Keywords: Imbalance, freight price, inland waterway transport, trade, spatial network

According to economic trade theory, in spatial networks, imbalances in transport flows affect freight prices in the sense that freight prices in the high demand direction are higher than freight prices in the low demand direction. However, this causal relationship has hardly been empirically identified in the literature. We study the effect of imbalances in transport flows on freight prices, using data from a spatial network of the inland waterway transport market of North Western Europe. We extend the existing economic theory on imbalance and we find that imbalances in transport flows may explain up to 35% differences in freight prices. In line with theory, we find that the effect of imbalance on freight prices becomes more pronounced due to exogenous changes in transport costs.

Intermodal Competition in the London-Paris Passenger Market: High-speed Rail and Air Transport

C.L. Behrens, A.J.H. Pels

Keywords: inter- and intramodal competition; multinomial logit

This paper presents empirical evidence about inter- and intramodal competition in the London-Paris passenger market.

An extended literature research shows that inter- and intramodal competition is expected to be present in the London-Paris passenger market. However, no empirical evidence for this specific market is found in the literature. Using revealed preference data, several nested multinomial logit models are estimated to examine the choice of passengers between seven alternatives to travel from London to Paris (six aviation and one high-speed rail (Eurostar)). Based on the estimation results, direct- and cross elasticities of demand with respect to several attributes are derived and discussed. In addition, a case-study about the movement of Eurostar services from Waterloo International to St Pancras International station is included.

According to the empirical analysis, inter- and intramodal competition is definitely present in the London-Paris passenger market. It is shown that demand in the London-Paris market is relatively elastic, and that the aviation and high-speed rail alternatives are rather homogenous in unobserved effects. In other words, passengers seem to be able to substitute several alternatives and react to changing strategies of airlines, airports or the high-speed rail operator. However, the extreme large market share of the Eurostar in this market and the current withdrawal of aviation alternatives from the market indicate that inter- and intramodal competition in the long run will decline.

Labour Supply and Commuting: Implications for Optimal Road Taxes

Eva Gutiérrez-i-Puigarnau and Jos van Ommeren

Keywords: Commuting cost, congestion tax, labour supply

There is a growing literature on the relationship between labour supply and commuting, but the distinction between number of hours per day and number of

days (e.g. per week) has generally been ignored. Recently, the seminal paper by Parry and Bento (2001) shows that revenues of a welfare-maximising road tax should be used to reduce the distortionary income tax. The authors assume that the number of working days are optimally chosen, whereas the number of hours per day is fixed. This assumption implies that given a road tax, workers may only reduce their commuting costs by reducing the number of days, but not the number of daily hours. A standard labour supply model allows for optimally chosen number of hours per day and optimally chosen number of days. The model implies that commuting distance increases the number of hours per day, but the effect on total labour supply is ambiguous. This paper addresses this issue by analysing the relationship between labour supply patterns and commuting distance using socio-economic panel data for Germany between 2002 and 2006. Our analysis indicates that the effect of commuting distance on labour supply is quite weak. We find that commuting distance has a positive effect on the number of hours per day worked, with an elasticity of about 0.006 in line with the theoretical model. Furthermore, we find hardly any effect on total labour supply, suggesting that budget neutral reduction in the income tax, as advocated by Parry and Bento (2001), may not be necessary.

Modelling Urban Toll Associated to a Modal Policy: Objective to Reduce External Effects of Cars

Julie Bulteau

Keywords: urban toll, modal policy, public transport, environmental costs

This article deals with the internalization of the negative external effects generated by using cars. The objective is to find the best economic tool and modal policy to reduce congestion as well as environmental costs generated by cars. Two modes of transportation are taken into account: cars and collective transport, the latter considered as being non-polluting. Several types of urban tolls are investigated and is proposed a redistribution policy of gains from urban tax to collective transport. The uniform toll has the greatest impact on car traffic reduction but induces the highest social total cost. Numerical simulations back up this analysis. I analyse the trend of social total costs in relation to time value and fixed cost of collective transport.

Monetary Evaluation of Safety Measures

Gila Albert, Tomer Toledo and Shalom Hakkert

Keywords: Evaluation, Safety, Improvements, CBA

Light Good Vehicle (LGV) is a commercial vehicle used for the carriage of goods with a maximum weight of more than 1 and less than 3.5 tons. In the last years, both the number of LGVs and their participation in accidents significantly increased in EU-25 countries.

This paper focuses on the monetary evaluation and comparison of various safety measures for improving traffic safety for LGVs in the EU-25. These measures include the installation of active speed limiters with two different set speeds (100km/hr and 120 km/hr), electronic stability protection (ESP) systems, digital tachographs, event data recorders (EDR), seat belt reminder and seat-belt lock systems, and implementation of a professional driver training program. The monetary evaluation has been done using cost benefit analysis (CBA). The costs of each safety strategy were compared with the possible social benefits; the benefit is the value of avoiding a (statistical) fatality or casualty as a result of equipping the LGV fleet with the safety measure. Benefits were estimated based on the application of the official UK and German national crash costs. The CBA has been carried out by means of B/C ratios and includes a sensitivity analysis, as well as a computation of the cost per life saved.

Our results indicate that speed limiter set a the lower speed, a professional driver training program and devices to increase seatbelt wearing are economically justified and should serve as the core of safety improvements for LGVs. These results remain robust even if large changes occur in the unit costs or in the safety effects of these measures.

The Olympic Legacy Dilemma - Designing Transport Systems for beyond the Games

Petros Ieromonachou, Stephen Potter and James P Warren

A major part of the infrastructure programme for the London 2012 Olympics is to provide a legacy that will play a major part in regenerating the area in which they

will take place as noted in the Olympic bid. For example, the Olympic Stadium is being designed so that it will accommodate the numbers for Olympic events and then can easily be adapted for smaller numbers for its post-Olympic legacy use. This follows the experience from Sydney's stadium in Australia.

Ground transport provisions for the 2012 Olympics are seen as providing an infrastructure legacy for economic and social regeneration across East London. There is, however, a strategic design conundrum in that requirement to design transport infrastructure for a well-defined specific need, yet simultaneously provide for far less well defined future economic and social developmental opportunity. The legacy need is more important for the city economy, but the short-term design requirements are much better specified and funded.

This design dilemma is an issue that has implications beyond the immediate context of the London 2012 Olympics. Very often transport programmes are designed to address a particular market – for example to serve a specific development opportunity - with less attention paid to other markets or other social and economic impacts. Repeatedly, transport system design for major events is based on peak loads.

This paper will explore this issue by drawing upon examples of transport infrastructure included in the London Olympics that have parallels in the transport provisions for previous Olympic venues. Examples in the paper will consider how the Athens or Barcelona transport infrastructures have been used in practice post Olympics. This retrospective review will help identify key factors and lessons in the transport infrastructure design conundrum, which requires particular attention for London 2012.

The paper will provide a framework to evaluate the transport infrastructure design conundrum and will identify how well-specified short-term design requirements might be combined with the need to flexibility address long-term transport needs.

Optimal Congestion Pricing in a Wage Bargaining Model

Bruno De Borger

Keywords: wage bargaining, congestion tolls, commuting

In this paper we study optimal congestion pricing in a wage bargaining model, taking into account the intimate relation between congestion, commuting and the negotiated outcomes on the labour market. We first show that, compared to a competitive labour market environment, wage bargaining may lead to substantially different optimal transport taxes. Second, bargaining implies that exogenous increases in congestion levels and in transport taxes raise negotiated wages and reduce employment levels; the strength of these effects depends on the union's attitude towards transport issues. Third, when taxes cannot be differentiated according to trip purpose, we show that the optimal transport tax positively depends on the impact of congestion on negotiated wages, and negatively on the wage effects of the congestion tax itself. Using a standard specification for union preferences, the optimal transport tax exceeds the marginal external congestion cost to the extent that transport flows include demand by people not currently active on the labour market. Finally, if taxes can be differentiated according to trip purpose the tax structure implies shifting the tax burden away from the employed. This typically results in commuting subsidies, in the sense of lower transport taxes on commuting than on non-commuting transport; the size of the subsidy depends on the composition of transport demand. The optimal congestion tax on commuters is strictly below the marginal external cost.

Ownership and Competition in European Public Transport: A dynamic ARCH Stochastic Frontier Efficiency Assessment

Matthew G. Karlaftis

Keywords: Ownership, Competition, Public Transport, Efficiency

Ownership and competition and their effect on public transit system efficiency is a topic of considerable interest for both researchers and policy makers. Although a number of different modeling frameworks have been used for assessing efficiency, the stochastic frontier error component model has found extensive applications in transport assessment; most empirical stochastic frontier formulations assume error components that are independent homoskedastic random variables, an assumption that imposes a number of practical restrictions in the estimated functions. In this paper we use and test a new model

specification that incorporates a dynamic ARCH stochastic frontier specification that allows for a persistence in the dynamic development of technical inefficiency. We assess the effects of ownership and competition on European public transport systems with data from 15 European systems for a ten year time period (1990-2000). Preliminary results indicate: i. a clear rejection of the standard frontier model and existence of ARCH-related heteroskedastic technical inefficiency; ii. transport operators in cities where open entry competition has been introduced demonstrate increased efficiency; and, iii. efficiency findings vary between homoskedastic and heteroskedastic error component formulations.

Pay-As-You-Drive (PAYD): a Case Study into the Safety and Accessibility Effects of PAYD Strategies

J. Zantema, D.H. van Amelsfort, P.H.L. Bovy, M.C.J. Bliemer

Keywords: Transportation modeling, Pay-As-You-Drive insurance, pricing, reward, traffic safety

This study compares the safety and accessibility effects of Pay-As-You-Drive (PAYD) strategies, simulated using a transportation model. PAYD is an insurance policy for car owners where, to better reflect crash risk, the insurance premium is paid per kilometer actually driven. With more advanced monitoring technologies, the PAYD insurance premium can be further differentiated to reward safe driving behavior with a lower premium. This more differentiated concept of PAYD is currently being tested in a real life pilot. As part of this pilot a modeling study has been performed in order to assess the possible network (safety) effect of large-scale implementation of PAYD. The setup and results of this modeling study are described in this paper.

Seven PAYD strategies have been investigated with different kilometer-based insurance premium differentiations (road category differentiations, time differentiations, age differentiations). The network effects appear to vary greatly depending on the design of the PAYD strategy. The most common effects found in this model study are mode shifts and trip making (elastic demand effect) and route shifts.

To improve traffic safety, the best strategy would be to differentiate premium to reflect safety, i.e. higher fees for unsafe road categories and nighttime driving,

most effectively and apply it to all drivers. This way, drivers optimize towards the lowest cost and highest traffic safety. Total crash reduction is estimated to be more than 5% with the model, resulting in a reduction of 60 fatalities and over a 1000 injured by traffic each year in the Netherlands.

Potential Roles of Project Financing in Transforming the Port of Genoa

Isabella Lami, Elena Donellini

Keywords: project financing, infrastructure, risk scenarios

The paper starts by noting Italy's infrastructural shortcomings and the need for such alternatives to simple public funding as project financing.

Specifically, the paper presents an economic and financial analysis of a project intended to radically transform and upgrade the port of Genoa, where the docks will be enlarged and a dry port container terminal will be built on the inland side of the Apennines. The two port facilities will be connected by a tunnel for the special shuttles that will transport the TEUs between them. The conventional economic indicators calculated for this project were analyzed from the standpoint of the entire project's capacity for self-financing, as well as in terms of projected profits for the operation's promoters.

Project risks were assigned and quantified with an eye to determining the advisability of relying on private capital.

Analytical analysis was complemented by a further, more probabilistic analysis which investigated several possible risk scenarios. The major risk components were estimated in monetary terms, considering their percentage impact over time and applying a sensitivity analysis.

Investigating this case holds particular interest, as it is one of the projects for upgrading the logistics system of northwestern Italy that are currently being considered by the area's regional governments.

Pricing the Major Hub Airports

Joseph Daniel and Katherine Harback

Keywords: airport congestion pricing, stochastic queuing, bottleneck model

Implementing congestion pricing at twenty-seven major US airports could reduce delays by as much as thirteen passenger-years and one thousand aircraft-hours every day. The dollar value of these savings totals between five and seven million dollars. Airport revenues would increase about ten to twelve million dollars daily. We use a bottleneck model with stochastic queues to calculate equilibrium congestion price schedules and welfare gains from changes in airline and passenger layover-, connection-, and queuing-time costs that result from replacing weight-based pricing with congestion pricing. The model generates the equilibrium fee schedules, traffic rates, and queuing delays by minute of the day at all twenty-seven airports. We calculate the equilibria under alternative assumptions that airlines do or do not internalize their self-imposed congestion. The appropriate fees under either specification substantially reduce airport delays and social costs while increasing airport revenues. Incorrectly assessing non-internalizing fees on internalizing airlines, however, would be a costly mistake.

Public Private Partnership for Urban Mobility

Noemi Patumi and Giuliano Sparacino

Keywords: urban mobility, investments, public private partnership, pollution tax systems, “value capture”, mobility management and city logistics

The fast development of economic activities linked to the sector of services and their condensation in the inner city, the growing up of transversal displacement in respect to the inhabited areas caused by spare time purposes and the urban sprawl are at the basis of the increasing congestions of urban mobility that are becoming more and more warring.

An important condition for the reversal of this tendency is the realisation of efficient infrastructures and services of urban mobility. Indeed, the answer to the problem of traffic in a metropolitan area implies two different aspects. First, it is necessary to invest in the infrastructure equipment: an efficient infrastructural system generates relevant saving of costs and time, with evident advantages for the economic system in its all. Secondly, it is important to organize and optimize the existent flows: the fact that social costs of mobility excide private costs,

makes essential to formulate corrective interventions to the autonomous behaviour of individuals.

The principal obstacle to the development of infrastructures and services, in a contest characterize by more and more tight budget constraints, seems to be the finding of necessary resources. During the years, both at the international and national level, some interesting experiences concerning the funding of transport infrastructures have been developed through different forms of collaboration among public and private subjects (PPP) as project financing, pollution tax systems, land and commercial “value capture”, etc. At the same time, these forms of collaboration has been more and more applied also in the organisation and in the optimisation of existent flows: as examples, it can be mentioned the experiences of Mobility Management - that involves different economic subjects and public administrations - or the experiences of City Logistics.

The aim of the paper is to focalise and systematize the role of Public Private Partnership in the resolution of problems connected to urban mobility. First of all, the paper will consider some of the most recent and successful experiences at international level (as Congestion charges in London). Afterwards, by the comparison between these ones and the most interesting Italian experiences implemented until now (as Ecopass in Milan), the paper will underline the plausible perspective of development of PPP in the Italian contest.

A Random Utility Model for the Location of Real Estate Investment

Vincenzo Del Giudice; Pierfrancesco De Paola; Francesca Torrieri

Keywords: property market, random utility models, investment choices.

Now a day, the valorization of real estate assets is one of the main activities on which territorial marketing strategies are based in a competitive perspective.

Due to the complexity of the mechanisms that regulate the behavior of actors in real markets, it is difficult to define in advance what are the factors that determine the competitive capacity of a city in attracting investment in the real estate market.

It is therefore useful to have decision support systems to define those territorial factors that determine the “attraction” capacity of such investment.

The present paper aims to define a random utility model capable of simulating the behaviour of market operators in choosing between alternative investment sites.

Specifically, it proposed a “multinomial logit” model suitable for decision-making contexts in which the choice between discrete alternative should take place under conditions of uncertainty.

In particular, the model proposed, on one hand meets the need to define the “attractiveness” of a territory in respect of real estate investments, on the other hand, to explain what effects produce the characteristics of the site of investment on market operator’s choices.

In concluding part of the contribution, an application of the model is proposed to the example case of the choices of investment in the residential sector.

On the Relationship between Airport Pricing Models

Leonardo J. Basso and Anming Zhang

Keywords: Airport pricing, airport congestion, vertical structure

Airport pricing papers can be divided into two approaches. In the traditional approach the demand for airport services depends on airport charges and on congestion costs of both passengers and airlines; the airline market is not formally modeled. In the vertical structure approach instead, airports provide an input for an airline oligopoly and it is the equilibrium of this downstream market which determines the airports’ demand. We prove, analytically, that the traditional approach to airport pricing is valid if air carriers have no market power, i.e. airlines are atomistic or they behave as price takers (perfect competition) and have constant marginal operational costs. When carriers have market power, this approach may result in a surplus measure that falls short of giving a true measure of social surplus. Furthermore, its use prescribes a traffic level that is, for given capacity, smaller than the socially optimal level. When carriers have market power and consequently both airports and airlines behave strategically, a vertical-structure approach appears a more reasonable approach to airport pricing issues.

Rewarding Instead of Charging Road Users: a Model Case Study Investigating Effects on Traffic Conditions

M.C.J. Bliemer, D.H. van Amelsfort

Keywords: Rewarding, pricing, dynamic traffic assignment model, departure time choice

Instead of giving a negative incentive such as transport pricing, a positive incentive by rewarding travelers for ‘good behavior’ may yield different responses. In a Dutch pilot project called Peak Avoidance (in Dutch: “SpitsMijden”) a few hundred travelers participated in an experiment in which they received on average 5 euros per day when they avoid traveling by car during the morning rush hours (7h30 – 9h30). Mainly departure time shifts were observed, but also route changes and switching to public transport was observed. Due to the low number of participants in the experiment, no impact on traffic conditions could be expected. In order to assess the potential of such a rewarding scheme on traffic conditions, a dynamic traffic assignment model has been developed to forecast network wide effects in the long term by assuming higher participation levels. This paper describes the mathematical model. Furthermore, the Peak Avoidance project is taken as a case study and different rewarding strategies with varying participation levels and reward levels are analyzed. First results show that indeed overall traffic conditions can be improved by giving a reward, where moderate reward levels and participation levels of 50% or lower are sufficient for a significant improvement.

The Role of Infrastructure on Public Transport Service Reliability

Shahram Tahmasseby; Rob van Nes

Keywords: infrastructure, public transport, reliability

Operating rail bound public transport networks requires dedicated infrastructure. However, infrastructure might not always be available as planned. A number of events influences public transport infrastructure. For instance, it is possible that some part of infrastructure is blocked for a while due to events such as traffic

accidents blocking a junction or a broken-down tram blocking a track. In these situations, the services can not operate as planned. In case that suitable infrastructure alternatives are available for detours; the public transport operator may continue the affected lines' operation and maintain the service network connectivity. For rail-bound services this requires special attentions. In other words, for rail bound public transport networks detours are only possible using the infrastructure that is either already used by other rail-bound public transport services or by using additional shortcuts in the rail infrastructure. Thus, considering the service network connectivity in public transport network design leads to a new challenge in infrastructure network design. A possible design question then is to determine where and which type of shortcuts should be provided in a public transport infrastructure network. We address this issue by analyzing the impacts of different infrastructure shortcuts on the service network connectivity. The assessment criteria are network connectivity reliability and corresponding costs including investment costs for infrastructure shortcuts and reliability cost. Our approach clearly shows that combining infrastructure facilities such as shortcuts will increase network connectivity reliability and might even lead to a reduction in total network costs. The analyses for a radial service network show that larger ring shortcut facilities provide more detour possibilities and thus, will be more effective, even though the infrastructure costs are higher.

Scheduling System for the Regulation of Long-haul Service with Use of Road Trains.

Oleg Poklad

Keywords: through system, district system, truck (hybrid) tractor, detachable semi-trailer, route section (district), tractor maneuvering turnaround, packet schedule.

The main task of this paper is to review the principal aspects in organization of interurban long-haul service with the use of road trains on the basic of the "district" traffic system. The goal of the paper is to determine the most effective methods of trucking operations in order to highlight the regularities that characterize these methods. The paper describes practicable methods of freight

flow analysis, some factors and parameters concerning movement of motor-vehicle trains and original route schedules as well.

Of special interest is the obtained algorithm of economically effective trucking operation of motor-vehicle trains on the route.

Socio-dynamic Discrete Choice on Networks

Elenna R. Dugundji

Keywords: discrete choice, non-global interactions, multi-agent based simulation

A model is considered where a commuter's choice of transportation mode is influenced by neighbors and peers' mode share, accounting for common unobserved attributes of choice alternatives in the error structure. Non-global interactions are addressed within different social and spatial network structures, combining advanced econometric estimation with computational techniques from multi-agent based simulation. Additional heterogeneity is introduced in the model through standard mechanisms, such as individual-specific socio-demographic characteristics of the agents, individual-specific attributes of the choice alternatives, and availability of alternatives. This paper extends earlier work by systematically exploring effects of sample size, initial conditions, geographic scale and systematic omitted links. Limitations of the present study are highlighted and recommendations for future work are made.

Solving Congestion with Tradable Reservations

Mark Lijesen

Congestion is serious problem for urban areas worldwide and is claimed to cause substantial economic damage due to increased travel times for goods and people. Various instruments have been proposed and used to solve or mitigate congestion, often without success. This paper proposes a scheme where people have to make reservations to use the road. Once the number of reservations exceeds a threshold level, no new reservations are accepted. Reservations may be traded among road users though, and a price for road use will be set on the secondary market. The scheme has some favorable properties in common with

schemes for emission trading. The total amount of reservations is known in advance and does not depend on uncertain reactions, the trade mechanism ensures that highly valued trips can be made without delay and public support is likely to be higher as the scheme does not increase the tax burden. The paper discusses the main features of such a scheme and its properties. We set up a simple simulation model based on real world data to illustrate the working and discuss the pros and cons, as well as the practical problems that would have to be solved before implementation could take place.

A Sustainable Urban District: Layout, Transportation, Environment

Daniel Gat, Shlomo Bekhor, Eran Leck

Keywords: Urban transport nodes, urban development and real estate

The Research Question: Will a shift toward an integrated spatial organization of land use and the transportation network trigger a parallel shift in commuting practices – a decline in automobile usage and a corresponding decline in vehicular related pollution?

The Method: Since the idea is to consider and evaluate a change in built form, we decided to take the following steps:

- To plan and design an innovative urban quarter according to specifications that would make it transit and slow-mode (walking and biking) friendly, known in the literature as "transit oriented development" or TOD.
- The specifications are formulated in the style of Alexander's pattern language statements – a method that creates a linkage between scientific knowledge and planning decisions.
- To plan a corresponding "bench-mark" urban quarter named and organized according to "business as usual" practices – relying mainly on use of the car, thus providing little if any incentives for transit or the slow modes.
- To estimate trip demands generated by both the TOD and benchmark plans, predicting the origin to destination flow of trips, the modal split, route choice, and vehicular velocities on parts of the network.
- To use the output of the trip estimation as an input to a pollution generation model that computes the output of vehicular pollution under the two plans.

Findings:

- Our proposed plan that integrates land use planning and design with thoughtful organization of vehicular transportation, transit and slow mode networks, predicts (in our computerized simulations) a major shift in commuting practices in the desired direction: 40% slow mode trips in the TOD model compared with 5% in the benchmark model.
- Translating the transportation behavior estimates over the mapped network into vehicle generated pollution predicts a non trivial improvement in air quality conditions: a 10% average decline in all types of pollutants and an even larger decline at areas of high pedestrian activity.

Technological Innovation in the Airline Industry: The Impact of Regional Jets

Jan K. Brueckner and Vivek Pai

Keywords: regional jet, technological change, flight frequency

This paper explores the impact of the regional jet (RJ), an important new technological innovation in the airline industry, on service patterns and service quality. The paper's theoretical analysis predicts that the frequency advantage of RJs over jets, a consequence of their small size, should have led to the emergence of point-to-point (PP) service in thin markets where such service was previously uneconomical. However, the evidence contradicts this prediction, showing that markets attracting new PP service by RJs had demographic characteristics similar to those of markets that already had jet PP service or attracted it after 1996. Additional descriptive evidence shows that RJs were used to provide service on a large number of new hub-and-spoke (HS) routes, and that they replaced discontinued jet and turboprop service on many such routes, as well as supplementing continuing jet service. When replacement or supplementation by RJs occurred, passengers benefited from better service quality via higher flight frequencies.

Tolling, Capacity Selection and Equilibrium Problems with Equilibrium Constraints

Andrew Koh, Simon Shepherd

Keywords: Tolling, Competition, EPEC, collusion

An equilibrium problem with an equilibrium constraint is a mathematical construct that can be applied to private competition in highway networks. In this paper we consider the problem of finding a Nash Equilibrium regarding competition in toll pricing on a network utilising 2 alternative algorithms. In the first algorithm, we utilise a Gauss Siedel fixed point approach based on the cutting constraint algorithm for toll pricing. In the second algorithm, we extend an existing sequential linearcomplementarity approach for finding Nash equilibrium subject to Wardrop Equilibrium constraints. Finally we consider how the equilibrium may change between the Nash competitive equilibrium and a collusive equilibrium where the two players co-operate to form the equivalent of a monopoly operation. Between these two equilibria we shall consider the effect of leadership and type of game being played.

Tradeoffs among Free-flow Speed, Capacity, Cost, and Environmental Footprint in Highway Design

Kenneth A. Small and Chen Ng

Keywords: highway design, capacity, free-flow speed

This paper investigates differentiated design standards as a source of capacity additions that are more affordable and have smaller aesthetic and environmental impacts than expressways. We consider several tradeoffs, including narrow versus wide lanes and shoulders on an expressway of a given total width, and high-speed expressway versus lower-speed arterial. We quantify the situations in which off-peak traffic is sufficiently great to make it worthwhile to spend more on construction, or to give up some capacity, in order to provide very high speeds in situations where peak travel will be slow due to congestion. We account for differing accident rates. The results illustrate possibilities for expanding the range

of highway designs that are considered when adding capacity to ameliorate urban road congestion.

The Transformation of the Zurich Central Station: Processes of Urban Renewal and Regeneration

Isabella Lami, Laurent Staffelbach

Keywords: railway area, urban renewal, communication strategies

This paper is based upon a real case of railway area transformation, the Zurich central station.

The case is particularly interesting because it demonstrates how careful process management was able to go beyond a vision centering only on the infrastructure's utility – its value in use – and focus on its symbolic and cultural value (Quaini, 2006), while at the same time succeeding in making the project financially viable.

In 2003, following the decision to build a second through route for long-distance trains, SBB promoted a design competition for the new master plan in the area around Zurich's central station, which called for a high-density office, residential and service district.

The operation's success stemmed from five key factors:

1. The fact that the project was based on qualitative rather than quantitative concepts, in particular by separating the idea of urban quality from cubic volume and lot coverage limits.
2. The ability to channel the interest of multiple stakeholders in the project by combining the strategies of SBB and Swiss Post (one of the owners of the area), or in other words by maximizing its net value and active participation in development, thus ensuring the high urban quality the municipality had set out to achieve (Patassini, 2006).
3. The creation of a shared dream among the public (Mazza, 2004) which made it possible to recover new space for the city, making the area more open and livable by eliminating divisive elements such as the rail tracks.
4. The use of a stepwise development procedure, which made it possible to avoid opposition through an excellent communication strategy (this process was initiated from the beginning, when only the basic principles had been announced,

through press coverage and the creation of a sounding board), and to create the market conditions for maximizing the operation's potential profitability.

5. The establishment of a joint development company by Swiss Post and SBB, which enabled the two groups to find common ground and bring their long-standing antagonism to an end.

The case-study's interest lies in its skilled management, which employed consensus-based procedures, financial transactions and communication strategies that culminated in a financially successful operation that met with public approval.

Transport and Welfare Consequences of Infrastructure Investment: A Case Study for the Betuweroute

Mark Koetse, Jan Rouwendal

Keywords: Port competition; Transport pricing; Betuweroute

This paper presents a case study on the Betuweroute, a 160 kilometre dedicated freight railway line connecting the port of Rotterdam with the German Ruhr area. The Betuweroute is an interesting example of a major investment in railroads for several reasons. Political decision making on the Betuwe project and calculations on its profitability were based on questionable assumptions, the two most important ones being that freight transport by trucks would become substantially more expensive, and that inland waterways would not be used more intensively for freight transport. Even though construction is completed, it is still unclear to what extent the route is going to be used in the future. It should be noted that it provides a potentially important link in the transport network that links the major harbours of Hamburg, Rotterdam and Antwerp with the German hinterland. If the line could – in the near or more remote future – attract a large share of transit freight, as was expected in official project appraisals, it will be of considerable importance for the competitive position of the port of Rotterdam relative to Hamburg and Antwerp. In this paper we use the MOLINO model in order to analyse the effects of the Betuweroute on transport flows and port competition together with its welfare consequences. We also investigate the impact of marginal social cost pricing. The network we use includes the ports of Rotterdam, Antwerp and Hamburg and distinguishes between transport by road, railway and

inland waterways. Since the Betuweroute connects Rotterdam to the Ruhr area, we use transport to and from this area as the driving force of the transport flows on this network. We run the model from 2000 to 2025 using scenario's with and without the Betuweroute and with and without marginal social costs pricing.

Urban Expansion or Clustered Deconcentration? An Applied Welfare Economic Analysis of Growth Controls and the Foundation of Satellites

Wouter Vermeulen, Jan Rouwendal

Keywords: land use regulation, growth controls, systems of cities, housing markets, applied general equilibrium

How should urban containment and the diversion of households to nearby residential areas be evaluated from a welfare economic perspective? Assuming the existence of a negative externality of city size, we develop a concise general equilibrium model for a mother city and a satellite. This satellite should be founded if the gain in surplus exceeds the fixed costs of intercity infrastructure provision, and a Pigouvian tax on the conversion of land to urban use in both cities would then attain the first-best allocation. Rising incomes and falling transport costs enhance the surplus gain from 'clustered deconcentration', or the accommodation of growth in planned satellites, relative to expansion of the mother city. Nevertheless, plans by the Dutch government to uphold strict growth controls around Amsterdam, while fostering large-scale residential construction projects in the nearby satellite of Almere, are found to be suboptimal in a calibrated version of our model.

Urban Form and Daily Mobility. Methodological Aspects and Empirical Study in the Case of Bordeaux (France)

Guillaume Pouyanne

Keywords: city, urban density, urban form, daily travels, land use patterns

The influence of land use patterns on daily mobility can be described thanks to two dimensions of urban form : the first is quantitative, that is density, and the second is qualitative, that is land use mix. Empirical studies usually add control variables such as socio-demographic characteristics. They suppose that urban form factors and socio-demographic factors have a separate influence on travel patterns.

In this paper, we first show the possibility of a causal relationship between urban form and socio-demographic characteristics. Thus previous results, which suppose that these two kinds of factors are separated, may be biased. We provide a new, more complex conceptual framework, the "triangular relationship". It describes systemic relationships between urban form, socio-demographic characteristics and daily mobility. As a consequence, we have to use specific econometric methods to test the motives of mobility. We develop a new tool : the so-called "typological regressions". Travel patterns in the metropolitan area of Bordeaux are then analyzed thanks to this new relevant method. The results allow to disentangle the interactions between land use patterns and travel behaviours.

Using Incentives as Traffic Management Tool

Dick Ettema, Jasper Knockaert, Erik Verhoef

Keywords: behavioural change, reward, congestion reduction

Although positive incentives have been successfully applied in various domains to influence behaviour, they have received limited attention in transportation. This paper reports on the Dutch 'Spitsmijden' ('Peak Avoidance') project, in which travellers received positive incentives if they avoided travelling in the peak by car. Incentives could be financial (3 to 7 EURO per day) or credits to earn a smartphone at the end of the experiment. Travellers' responses were measured using electronic detection equipment and travel diaries. The results of the study indicate that positive incentives are able to reduce the amount of peak traffic by 60-65%. Travellers mainly responded to the incentives by shifting their car trips to the periods before and after the peak period. Although the experiment was intended to achieve a structural change in travel behaviour, we observed that travellers returned to the peak period when the incentives ended.

The Value of Reliability

Mogens Fosgerau, Anders Karlstrom

Keywords: Welfare; Random duration; Time; Scheduling; Reliability; Variability

We derive the value of reliability in the scheduling of an activity of random duration, such as travel under congested conditions. We show that the minimal expected cost is linear in the mean and standard deviation of duration, regardless of the form of the standardized distribution of durations. This insight provides a unification of the scheduling model and models that include the standard deviation of duration directly as an argument in the cost or utility function. The results generalize approximately to the case where the mean and standard deviation of duration depend on the starting time. Empirical illustration is provided.

Valuing the Costs of Travel Time Unreliability

P.R. Koster, E.T. Verhoef, E.Kroes, E. Pels

Keywords: value of reliability; scheduling; unreliability costs

In transport economics valuing unreliability of travel times has become an important topic. This paper links aggregate schedule delay cost (early and late) to the dynamic-equilibrium behavior of travelers on the road. This link is important because if transport policy changes the unreliability of travel times, estimated changes in welfare depend on induced behavioral adjustments. Higher uncertainty of travel times can result in bigger “buffers” that travelers will apply to avoid being late, so the expected costs for a trip increase. The cost of uncertainty of travel times is not only determined by a single measure of dispersion such as the standard deviation of travel times, but instead by the whole distribution of travel times. We propose a method to calculate the expected costs for a trip if the travel time is lognormally, weibull or gamma distributed and when travelers optimize their departure times. Finally, we use empirical travel time data to illustrate the effect of using different distributions of travel time on the total expected travel costs and the costs of unreliability.

Viability of a New Road Infrastructure with Heterogeneous Users in Madrid Access

Pedro Cantos-Sánchez, Rafael Moner-Colonques, José J. Sempere-Monerris, Óscar Álvarez San-Jaime

Keywords: Parallel road network, heterogeneous users, viability

This paper explores the importance of heterogeneity in value of time when assessing the viability of a new road infrastructure to alleviate congestion problems. The Spanish government has developed a congestion pricing demonstration entering Madrid city centre, where road users have to choose between a free but highly congested road and a priced free-flowing road. We consider a continuum of users who differ in their value of time. Users dislike congestion and this is more so the more a user values his travel time. A logit estimation is undertaken with information from a questionnaire among road users in the Eastern Madrid area to obtain users' value of time.

The impact and viability of artery road R3 under several competitive regimes is examined. The tolls obtained generate a traffic reallocation towards the new roadway such that revenues suffice to render the infrastructure socio-economically viable. This is so for all the competitive regimes analyzed even for modest traffic growth rates. Regarding economic viability, the artery road infrastructure is always economically viable under the private regime and for the other two regimes, a sufficiently high traffic growth rate is required.

Water-Level Risk on the Rhine River

E. Demirel, J. van Ommeren, P. Rietveld

Keywords: water-level risk, hedging, contracts

The weather derivative market has shown a rapid growth in the past decade, see Jewson and Brix (2005). Weather derivatives are used to reduce business risk which is attributable to changes in weather. Weather derivatives are comparable to financial derivatives which are used to hedge risk of financial portfolios.

In many academic texts, the possibility of the use of a weather derivative to cope with the risk of fluctuations in water-levels or stream-flow is mentioned. However we could not find any publication on water-levels up to the present. In this paper we analyse the benefit of a water-level derivative. This derivative can for example be used to cope with risks due to climate change in the Rhine river area.

What is a Low Cost Airline? Defining Carrier Business Models

Jane Edwards

Keywords: Air transport, Low Cost Carriers (LCCs), Benchmark Characteristics, Modelling, Europe

The characteristics of LCC's are widely documented but with increased demand for low cost air travel and growing competition between airlines and other modes of transport, the services delivered by LCC's are increasingly blurring with those of traditional network carriers. These factors hold implications for the strategies and management techniques adopted by airlines. This paper offers benchmark characteristics of European airlines, in order to identify the extent to which they follow a low cost / no-frills business model.

Cost and operational data has been obtained from the CAA and ICAO and a detailed matrix has been compiled using airline websites to identify the different service features offered. Statistical analysis and quantitative techniques can then be applied to identify the extent to which different airlines demonstrate the LCC characteristics.

The study provides evidence that the 'traditional' LCC no longer exists in practice, but is representative of a personalised service designed to meet the needs of an increasingly discerning passenger. This research is a pre-cursor to examining the behaviour of passengers and cultural changes in society as a result of the increased travel options available in the airline market.

The Workers' Marginal Costs of Commuting

Mogens Fosgerau and Jos Van Ommeren

Keywords: On-the-job search; Job moving; Commuting time; Commuting cost; Willingness to pay

This paper applies a dynamic search method for estimating workers' marginal costs of commuting employing data on workers' job search activity as well as moving behaviour for the Netherlands. We provide evidence that on average the worker's marginal costs of one hour commuting are about 15 to 18 euro.