

**Syllabus  
PUBP 721  
TRANSPORT ECONOMICS  
Spring 2003**

**Thursday 4.30pm – 7.10 pm  
Arlington Room 251**

**Professor: Kenneth Button**

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**Background**

Transport is a major industry in its own right but also supplies important inputs into other sectors. It also influences land-use patterns and the pace of economic development. This course provides a basis for understanding the economics of the transport system and, in particular, how transportation relates to urban, regional, and national development.

The course does not focus on any particular mode of transportation, but rather treats transport generically, although for illustrative purposes a number of case studies will look at specific modal examples. These case studies will, for instance, cover such things as urban traffic congestion (automobiles), subsidies (urban transit), infrastructure appraisal (road networks), social cost pricing (automobiles) and economic regulation (airlines and rail freight). It is primarily based in microeconomics, and hence looks at both the demand and the supply-side of transportation, but it also considers the interface of transportation economics with other disciplines such as civil engineering, operations research and human geography. But it is an economics course and not one in political economy.

**The Course**

The course will entail classes that include student participation. A number of ‘guest lecturers’ will offer presentations at various times. I have set out a large reading list BUT this is intended to provide a range of material that will help in individual assignments as well as being core reading. MUCH OF THE KEY MATERIAL WILL BE ON ELECTRONIC RESERVE IN THE LIBRARY OR WILL BE E-MAILED TO YOU. Access codes to obtain the material from the library will be given out in the initial class. It will be anticipated that students will have read the material on electronic reserve for this course (and indeed any other material they may find useful regarding the topic).

I will lay out a week-by-week set of specific topics AFTER the first class. The first class will be devoted to basic microeconomics. (You should try to up-date you economic knowledge from one of the dozens of elementary texts on economics before this class.) I

use this as a basis for determining just how fast to cover the core material and the style to adopt.

The main broad themes and issues that will be covered in the course are set out below.

## **1 Transport and Economics**

Transport economics makes use of a range of economic ideas and concepts to examine the nature of markets in which transport services are provided. Initially it is important to understand the general way in which economists view transport and the nature of the statistical sources that exist to help in the analysis of the sector.

Readings will include K.J. Button and D. Gillingwater, *Future Transport Policy*, Croom Helm, London, 1986; K.J. Button and A. Pearman (eds) *Applied Transport Economics: A Practical Case Study Approach*, Gordon and Breach, London, 1985; and K.J. Button, P. Nijkamp and H. Primus (eds) *Transport Networks in Europe: Concept, Analysis and Policies*, Edward Elgar, Cheltenham, 1998.

## **2 Movement, Transport and Location**

Transport is not wanted in its own right but is linked to the need for movement by firms and individuals. Transport also influences where these firms locate their activities and where individuals live. It is important to understand the interconnections between these effects to develop an analysis of transport markets.

Readings will include K.J. Button, P. Nijkamp and J. Thisse (eds) *Location Theory*, (2 Volumes) Edward Elgar, Cheltenham, 1996; K.J. Button, P. Nijkamp, Y. Berechman and N. Kohno (eds) *Transport and Land Use*, Edward Elgar, Cheltenham, 1998; and K.J. Button 'Regulatory reform, networks and economic efficiency', in C. Capineri and P. Rietveld (eds), *Networks in Transport and Communications: A Policy Approach*, Ashgate, Aldershot, pp.309-324, 1998.

## **3 The Demand for Transport**

The demand for transport is a derived one and varies over time (peaks). Understanding the nature of the factors influencing transport demand is important both for the private actors supplying transport services and for government bodies that have responsibility for regulation and control. Key concepts here are both the direct and cross price elasticities of demand and factors that cause shifts in the demand function. The importance of quality considerations is of importance and the concept of generalised costs has a central role to place in demand analysis. In many instances for social aspects of transport have resulted in the notion of demand giving way to that of 'need'.

Readings will include K.J. Button, 'The use of economics in urban travel demand modelling: a survey', *Socio-Economic Planning Sciences* Vol.10, 1976, pp.57-66 and K.J. Button and F. Navin, 'A public transport demand forecasting model for Vancouver', *Traffic Engineering and Control*, Vol.24, 1983, pp.27-31.

## **4 The Direct Costs of Transport**

Transport supply involves considerable financial costs. The supply function for transport services is often complex involving economies of scale, scope and density. There are also

often significant indivisibilities in the provision of transport infrastructure that make the allocation of costs to users difficult.

Readings will include K.J. Button, S. Tolofari and D. Pitfield 'An econometric analysis of the cost structure of the tanker sector of the shipping industry', *International Journal of Transport Economics*, Vol.14, 1987, pp.71-84; K.J. Button, S. Tolofari and D. Pitfield 'Shipping costs and the controversy over open registry', *Journal of industrial Economics*, Vol.34, 1986, pp.409-427 and K.J. Button, and K.O'Donnell 'An examination of the cost structure associated with providing urban bus services in Britain', *Scottish Journal of Political Economy*, Vol.32, 1985, pp.67-81.

## **5 The External Costs of Transport**

Transport has been described as 'industry on wheels' because of the environmental damage that it can cause. It is important in the assessment of transport options that all costs, included in the provision of transport are considered. This, for example, involves the placing of monetary values on the environmental implications of transport.

Readings will include K.J. Button, *Transport, the Environment and Economic Policy*, Edward Elgar, Cheltenham, 1993; K.J. Button and D. Banister (eds) *Transport, the Environment and Sustainable Development*, E & FN Spon, London, 1993; J. van den Bergh, K.J. Button, P. Nijkamp, and G.C. Pepping *Meta-analysis in Environmental Economics*, Kluwer, Amsterdam, 1997 and K.J. Button, P. Nijkamp and Y. Hanyashi *Environment and Transport*, Edward Elgar, Cheltenham, 1999.

## **6 Pricing of Transport Services**

The complexities of the demand and cost functions for transport services make pricing complex. The importance of peak load pricing and differential pricing (including two-part tariffs) have long been theoretically recognised as important and the introduction of new information systems and charging technologies has seen important moves at implementation.

Readings will include K.J. Button, 'Ownership, investment and pricing of transport and communications infrastructure', in D. Batten and C. Karlsson (eds) *Infrastructure, Economic Growth and Regional Development*, Springer, Berlin, pp.147-165, 1996; K.J. Button and M. Brooks, 'Yield management: a phenomenon of the 1980s and 1990s?', *International Journal of Transport Economics*, Vol.21, 1994, pp.177-196 and K.J. Button 'Pricing in the transport sector', in H. Meersman and E. van de Voorde (eds) *Transforming the Port and Transportation Business*, Acco, Leuven, pp.73-98, 1997.

## **7 Containing the External Costs of Transport**

Transport has always been regulated to contain some of the worst implications of external effects such as congestion and environmental intrusion. Many of these regulations have been of the command-and-control type (e.g. vehicle bans) but more recently there has been a move at deploying fiscal measures such as road pricing (to optimise congestion) and environmental taxes. Subsidies to less environmental damaging modes of transport (e.g. Metro) are also widely used in many countries.

Readings will include K.J. Button and J-P. Barde (1990) *Transport Policy and the Environment: Six Case Studies*, Earthscan/OECD, London/Paris; K.J. Button and E. Verhoef (eds) *Road Pricing, Traffic Congestion and the Environment*, Edward Elgar,

Cheltenham, 1998 and K.J. Button 'Environmental externalities and transport policy', *Oxford Review of Economic Policy* Vol.6, 1990, pp.61-75.

## **8 Investment Criteria – Private and Public Sector Analysis**

Transport infrastructure is generally expensive, long-lived, environmentally intrusive and inflexible. Private sector infrastructure is appraised using conventional financial criteria but public sector infrastructure involves the use of techniques that fall under the generic title of 'cost-benefit analysis'. The latter is wider and takes a longer view of the implications of investments.

Readings will include K.J. Button and A. Pearman (eds) *The Practice of Transport Investment Appraisal* (edited with A.D. Pearman), Gower Press, Aldershot and Renouf, Brookfield, 1983; K.J. Button and D. Pearce 'Infrastructure restoration as a tool for stimulating urban renewal - the Glasgow Canal', *Urban Studies*, Vol.26, 1989, pp.559-571 and K.J. Button 'Models for decision-making in the public sector', *OMEGA* Vol.7, 1979, pp.399-409.

## **9 Transport Planning and Forecasting**

Transportation is a complicated, network activity that may not be adequately co-ordinated through the market. Its implications may also extend beyond those that are included in narrow economic notions of efficiency. As a consequence transport is the subject of considerable planning of various kinds. To carry out this effectively, reliable transport forecasts are required and there are a variety of ways in which this may be undertaken.

Readings will include K.J. Button, A.D. Pearman and A.S. Fowkes (eds), *Car Ownership Modelling and Forecasting*, Renouf, Brookfield, 1982; K.J. Button, N. Ngoe and J. Hine, 'Modelling vehicle ownership and use in low income countries', *Journal of Transport Economics and Policy*, Vol.27, 1993, pp. 51-67.

## **10 Transport and Development**

Transport policy is often used as part of the development policy of national governments and local agencies. This is because of its interaction with the location of firms and individuals. These links are often difficult to trace out and to quantify – in many cases there is a tendency to overstate the role of transport in this context. The transport-land-use transport interactions vary between sectors.

Readings will include K.J. Button, S. Leitham, R. W. McQuaid, J. D. Nelson 'Transport and industrial and commercial location', *Annals of Regional Science*, Vol.29, 1995, pp.189–206; K.J. Button, S. Lall, R. Stough and M. Trice 'High-technology employment and hub airports', *Journal of Air Transport Management*, Vol.5, 1999, pp.53-59; K.J. Button 'High-technology companies: an examination of their transport needs', *Progress in Planning*, Vol.29, 1987, pp.79-146 and K.J. Button, E.T. Verhoef and C.J.M. van den Bergh 'Transport, spatial economy and the global environment', *Environment and Planning A* Vol.29, 1997, pp.1195-213.

## **11 The Regulation of Transport**

Transport has long been one of the most regulated of sectors because of its strategic importance, the potential for market failures and the potential for using transport to meet wider social and political objectives. More recently there have been moves in many

countries to liberalise the economic regulation of transport (e.g. regarding prices, ownership and market entry) while, at the same time tightened, social regulation (e.g over safety). There have been considerable developments in the economic theories of regulation in recent years.

Readings will include K.J. Button and T. Keeler 'The regulation of transport markets', *Economic Journal*, Vol.103, 1993, pp.1017-28; .K.J. Button and D. Pitfield (eds) *Transport Deregulation - An International Movement*, Macmillan, London, 1991; K.J. Button and D. Banister (eds) *Transport in a Free Market Economy* (edited with D. Banister) Macmillan, London, 1991; K.J. Button and R. Stough (eds) *Transport Policy*, Edward Elgar, Cheltenham, 1998; and K.J. Button 'Lessons from European transport experience', *Annals of the American Academy of Political and Social Science*No.553, 1997, pp.157-167.

### **BASIC TEXT:**

K.J. Button, Transport Economics (2nd Ed.) Edward Elgar.

### **Assessment.**

Assessment will take the form of:

1. Assignments periodically set throughout the semester relating to various classes (25%)
2. Mid-term open book (20%) on March 6
3. Final examination (45%) on May 8

### **Contact Points**

All students must have an e-mail address recorded with GMU and I will use that as the primary point of contact.