

# **TRAVEL TIME AND ECONOMIC GROWTH - CHANGING PERSPECTIVES ON TRAVEL CHOICES FOR SCOTLAND**

Derek Halden

DHC

2 Dean Path, Edinburgh, EH4 3BA

derek.halden@dhc1.co.uk

## **1. INTRODUCTION**

To what extent can the value of transport to society be captured by time savings? Transport economics relies heavily on using travel time changes as a proxy for the many social and economic benefits derived from transport investment. This paper reviews the advantages and disadvantages of using time savings in this way, comparing alternative methods for understanding transport policy choices.

## **2. TRAVEL TIME AND TRAVEL CHOICES**

The development of transport, the economy and society are interdependent and the impacts of transport on the economy and society are becoming both more complex and also relatively more important. In the 19<sup>th</sup> century the railways changed the geography of the country reinforcing cities as anchors of the economy and allowing economies of scale in production and consumption. The growth of car ownership in the 20<sup>th</sup> century extended the economic benefits of faster travel, by widening the choice of accessible locations. In the 21<sup>st</sup> century, the growth of the knowledge and experience economy is adding value to land, labour, production and consumption economies, and building new industries that depend as much on electronic as physical connections, and which exploit economies of scope as much as scale.

Transport is an important economic sector in itself and it also serves the needs of other sectors. Transport makes up more than 15% of household spending, more than any other sector of the economy, and this proportion is growing. Yet the amount of time people spend on travel remains remarkably stable, even where time has been saved as a result of transport investment (Metz 2008). Saved travel time is at least partly re-invested in more travel, with benefits being derived from opening up additional travel opportunities and choices.

Despite time savings being used to underpin most transport appraisals there is no consensus within the transport sector about how to value the benefits of these savings. The differences of view relate to: the way that travel behaviour is represented, the way that society and the economy are represented, the language used to describe accessibility changes, and concerns about the applicability of techniques to different type of investment choice.

Communicating the results of investment appraisals has become increasingly important, to make appraisal results meaningful to all of the people with a stake in transport delivery. With more complex policy challenges the transport sector is not just required to deliver on large scale road and rail investment, but on a wide range of new challenges for smarter towns and cities integrating transport with sustainable development goals. There is a gap between current Government policy aims to manage demand consistent with sustainable development and the expectations of travellers. Partly as a result of this gap, between real world decision making and theoretical transport appraisal approaches, transport assessments based on travel time savings have increasingly become less influential over transport investment decisions (Mackie and Nellthorp 2003). Even if value of time concepts are to be used in future

transport appraisal it is widely accepted that a change of terminology is required to enable better communication. The “value of accessibility” has been proposed as a better terminology (Mackie 2008).

Looking specifically at travel behaviour, the relationship between government investment and travel behaviour is extremely complex and this needs to be reflected in appraisal. Under established transport planning processes, planners predict how travellers might behave in response to travel time changes, and then invest in transport supply to either meet or manage this demand. However the prediction of travel behaviour is predicated on assumptions about the future, making all such predictions dependent on other predictions.

Related to this, is that the forecasts of travel behaviour are limited in accuracy by many unknowns. Even where the probability of a future change can be estimated, the effects of different changes in combination are less certain. Fully specified activity-based approaches to travel demand analysis, drawing from insights from behavioural economics and psychology, could improve the accuracy of travel time predictions, but these are not yet practical, or at least have not yet been achieved in practice (Schwanen 2008). There is also no prospect of simple travel behaviour rules being developed that allow all social and economic factors to be considered. Practical appraisal approaches require a more manageable subset of the travel behaviour issues to be considered in any investment decision, relevant to the decision being considered.

Even more complex than travel behaviour, are the many changes taking place within transport and society. Some argue that the value of travel time, as measured through revealed travel choices, acts as the best available proxy for the many complex relationships between transport and the economy (Mackie 2008). The willingness to pay and accept travel choices demonstrates social and economic value that cannot be measured more accurately by other means. Others note that it is not useful for the relationships between transport systems and the economy to be simplified in this way (Geurs 2012). Even if value of time could be calculated accurately for each social group and relevant economic purpose, which is disputed, the results of such analysis cannot easily be related to real world decision making.

Successful transport investment appraisal practice has depended on a more restricted analysis of particular issues, such as minimising social inequality, or supporting particular economic activities. This is achieved by managing investment risks considering all of the relevant variables for the analysis of each transport intervention (Halden 1996). Detailed approaches to deliver this follow the same principles that apply to any sustainable system. The design of scenario planning, risk management and system optimisation follow core principles established in disciplines such as systems engineering, which in turn follow the principles of the closed loop eco-systems (Head 2008). This is different from the project delivery focus more common in transport investment. As with travel behaviour, it is by changing detailed components within the system that intended consequences are secured, recognising both system goals and the resilience of each part of the transport system (Gordon 1968).

Overall the relationship between transport and society appears to be becoming more important, more complicated, less easy to manage, and more influenced by wider factors. The presumption that travel time savings can be used to represent all of the most important economic and social benefits can no longer be taken for granted. Travel time savings may not be purely a “myth” as envisaged by some (Metz 2008), but other dimensions of accessibility

need to be treated separately from time in order to understand real world choices. The remainder of this paper looks at how this can be achieved in practice.

### **3. THE UTILITY AND DISUTILITY OF TRAVEL**

If transport is predominantly a derived demand, helping people to get to work, shops and other needs, then reductions in travel time are predominantly a benefit. However travel can also be predominantly an end in itself, with extra time spent on a journey delivering benefits from the experience of travel. In practice all travel has components of utility and disutility so travel time is sometimes a benefit and sometimes a dis-benefit.

The STAG transport economic efficiency appraisal uses estimates of net utility taking account of both the utility and disutility of travel. Combining different economic effects within a net assessment can lead to inaccurate conclusions as travel time represents different things in each context. A traveller choosing between alternative destinations for a trip will weigh the benefits of the travel experience alongside perceptions of the quality of opportunity at each destination. Appraisal based on values of time averages out complex local effects, but these local effects can be at least as important as other more generalised factors when planning the actual changes to make. It might be better to make a journey more reliable and comfortable than reduce the time it takes so appraisal must be able to compare all options.

To ensure that appraisal considers both generalised and localised effects, STAG requires both transport economic efficiency and local accessibility calculations to be undertaken. This ensures that relevant changes in opportunity and choice are understood for each population segment in addition to aggregate transport economic efficiency. If the measurements of opportunity and choice under the accessibility and social inclusion assessment come to similar conclusions on the direction and scale of impact as the assessments of transport economic efficiency and location impacts, and all of the consequential effects have been accurately considered, then the appraisal conclusions should be robust. However in many situations the different approaches come to quite different conclusions suggesting that further investigation is required (Halden 2003). All appraisals make simplifications and assumptions which can affect the benefits identified. Travel time changes will not necessarily represent with the direction or scale of the actual benefits being delivered.

### **4. THE INTEGRATION OF TRANSPORT AND LAND USE**

It is common practice when looking at travel choices to identify existing land uses and the trips they generate. Often the impacts of new land use development on travel choices are also considered, but transport planners have not been particularly effective at influencing land use development to secure travel consistent with sustainable development.

Transport is predominantly a derived demand, and it often follows that land use changes have a much larger effect on travel demand than transport investment. For transport planning to be more influential in securing better transport systems, it must be integrated into the planning of the locations where proposed trip generating activities are to be undertaken. This has proved to be problematical in practice as planning of the location trip generating activities usually rests predominantly with non-transport sectors (Straatmeier 2008).

The non-transport sectors have statutory responsibilities for ensuring that all people can access their services and usually discharge these responsibilities by concentrating on core

values for their sector such as: health, social services, education, leisure services, employment services, legal services, and other provision. Transport obligations for these non-transport sectors are rarely given priority and it is common for these sectors to discharge their responsibilities for ensuring access by informing transport providers about transport needs. However transport departments could not possibly fund all the consequential transport investment needed as a result of decisions in other sectors. As a result, the travel choices available to people can decline as a result of land use changes.

It has been recognised that to successfully deliver better accessibility, transport and non-transport sectors need to plan service locations jointly. To achieve this, accessibility audits of land use plans were introduced to land use planning policy in 1995<sup>1</sup>. The approach was then reinforced with joint working requirements through community planning from 2002, and detailed approaches to deliver this through accessibility audits set out in STAG from 2003.

These requirements have sought to make it easier for employment, health, education, social services, environment, and planning departments to invest more efficiently and effectively in solutions for efficient travel choices for staff and clients. However there is far more failure of these partnership schemes than success. Where joint cross sector schemes have been established, it has not taken long for each sector to seek to tactically withdraw their funding in the hope that other sectors will pick up more of the costs. As a result travel time to some opportunities has increased and travel choices declined for many people.

Although transport authorities are ultimately accountable for improving travel choices, they cannot ultimately be held accountable if a land use planning, health, education, or other authority makes a decision that causes accessibility problems. Transport department objections to decisions in other sectors are rarely viewed as commanding sufficient significance to change policy, and are not often made with sufficient force to secure the investment in accessible solutions. The blurred accountability across sectors means that securing improved choice and opportunity for all people continues to be regarded as a secondary issue by both transport and non-transport sectors who continue to focus on issues where they can be held more directly to account (SEU 2003).

Given the polycentric power structures of a modern democracy this is a difficult issue, but audits of accessibility for each population group can quickly show where travel choices are constrained. The measures used, such as the number of jobs or shops accessible can be readily understood by both transport and non-transport practitioners, and by travellers themselves. Formal reporting mechanisms for these audits using user friendly measures help to prompt a constructive dialogue about solutions, raising aspirations and expectations about jointly delivered solutions.

## **5. PREFERENCE ANOMALIES**

The preferences of individuals are not stable over time and transport investment can significantly alter transport preferences (Sugden 2003). This is becoming increasingly important as transport investment through smarter travel programmes views changes in user preferences as a key deliverable, rather than a fixed parameter within evaluations.

---

<sup>1</sup> Department of the Environment, 1995. Policy and Procedure Guidance: A Guide to Better Practice – Reducing the Need to Travel Through Land Use and Transport Planning, PPG 13, HMSO, London, UK.

In any case, analysis of stated and revealed preference data demonstrates anomalies with disparities between valuations of benefit based on the willingness to pay (WTP) and willingness to accept (WTA) travel choices. These disparities show that sometimes people are prepared to pay more than their 'rational' WTP and sometimes less. The high willingness to pay for even very expensive taxi journeys home from hospital is one example of this. The perceived value is a function of the reference framework within which each decision is made. WTA exceeds WTP when people are following a habit or going with the crowd. WTP exceeds WTA when normative attitudes in a particular context (e.g. about the environment, fairness or risk) affect consumer judgements.

Travel time valuations have been largely based on willingness to pay (WTP) approaches but the evidence suggests that people's willingness to contribute is governed as much by ideas of fairness and reciprocity than any perceptions of the opportunity cost of travel. People are only willing to pay for what they consider is a fair share of the costs. These perspectives mean that people are reluctant to pay more through mechanisms like road charges, even though these charges would be small compared to other motoring costs.

When the appraisal methods used in the early 1990s were compared with the actual outcomes in the 10 years after opening the Skye bridge project, it was identified that although people were willing to pay to cross the bridge (and therefore the project was allowed to proceed) people were not willing to accept the price, requiring compensation for a perceived lack of fairness (DHC 2007). Complex social relationships seem to define what is and is not acceptable in ways that cannot easily be linked to a price.

The willingness to pay or willingness to accept factors such as the friendships made when travelling, or being part of a community of users are difficult to measure through surveys due to: tactical responses, response bias, poor understanding/representation of personal abilities, campaigning answers, and other factors that might lead people to value the benefits inaccurately. This has led appraisal towards more generalised valuation techniques, but this can mask the specific factors which create value in the investment.

A broader concept that travel time is needed to address these complexities. Measurements of accessibility can include all of the required variables. The capabilities and preferences of travellers can be represented explicitly, alongside connections between people, places and opportunities. Using these techniques, smarter travel programmes, such as informing and training job seekers about travel opportunities, can be directly compared with infrastructure changes such as providing a new bus or rail service (DHC 2003). The experiences of applying these methods have been successful in some places showing how the many complex factors can be added to traditional transport planning functions (Atkins 2012)

## **6. INVESTING IN TRAVEL CHOICES FOR SCOTLAND**

The economy of Scotland depends on a transport system that supports the travel needs and choices of people and businesses. Within the "democracy of the marketplace" people seem to want to spend more on transport. Where people have the choice to spend more on transport compared with other goods and services then transport spending seems to rise (Scottish Household Survey). The travel attracting the greatest increases in spending are those that offer new choices with aviation, taxis, car purchase, cycle purchase, coach travel and rail travel all growing strongly.

However not all people have increasing travel choices available and the case for government action is greatest where there is market failure. With travel times and costs rising for many people, falling accessibility for some people and places is probably the greatest market failure in transport. Yet transport investment and delivery still tends to emphasise market pressures, such as road congestion, rather than market failure, such as the inability of people and businesses to meet their travel needs.

Transport investment remains focused at growing the transport economy, rather than the wider economy. Investment to open up more opportunity and choice in the wider economy has not received as systematic treatment in transport planning but some general conclusions can be made based on the experiences of 10 years of accessibility planning (Halden 2012) as follows:

- Improving local access opportunities is essential to support local town and village centres. By distributing economic activity in more centres there are more employment opportunities in local shops and services offering people more variety and choice. This localism agenda can be in direct conflict with growing the transport economy. Fewer larger service centres require people to travel further with more car, bus, rail, taxi and air journeys generating transport sector growth. Partly as a result of this, in many STAG appraisals, mode shift from car to walking is still treated wrongly as a negative economic effect. The appraisals often fail to consider all local walking trips which tends to favour projects which support longer distance travel (DHC and ITS 2007).
- More investment is needed in the people who use transport systems. Investing in user skills is established for driving skills, and encouraging safer behaviour. These activities also help to shape public attitudes to transport with rites of passage such as learning to drive. Travel information and feedback in all communities is a developing area for transport investment. Investment in activities to integrate transport with local communities has been achieved through programmes like safe routes to school and stations. These programmes showing how practical improvements bring together users and providers for shared benefits that may be very much greater than traditional transport investment choices (DHC, Aberdeen University and ITP 2013).
- Investment for resilience needs a much higher priority. One of the main benefits of choice is that when one choice fails another is available. Businesses locate where they see flexibility and choice of skilled workers. Investing to improve opportunities and choice, and transport options, is a much neglected area (ITS 2012).
- Investing in new types of transport business such as transport exchanges and third party purchasers of transport would enable the transport industry to grow by expanding its scope rather than simply its scale. In most sectors of the economy the fastest growing markets are for high added value services and products. Transport has much more to do to grow the low demand, high value added opportunities.
- Reform to transport taxation could have substantial benefits for the economy and society. The current system of transport taxation constrains people and businesses to a limited set of choices. Although planned taxation changes are subject to regulatory impact assessments successive governments have been very cautious about their plans. This perhaps reflects the gap in transport social education noted above. There are potential opportunities for progressive changes. For example, if car users were able to opt out of flat rate road fuel taxation this would be an important start in enabling new types of pay as you go tariffs for travel (BCSC 2006). Insurance companies administer pay as you policies go for driver insurance and these could be adapted in partnership with government to secure wider social and economic aims. Current insurance policies are restricted to social benefits which can be captured in the marketplace such as

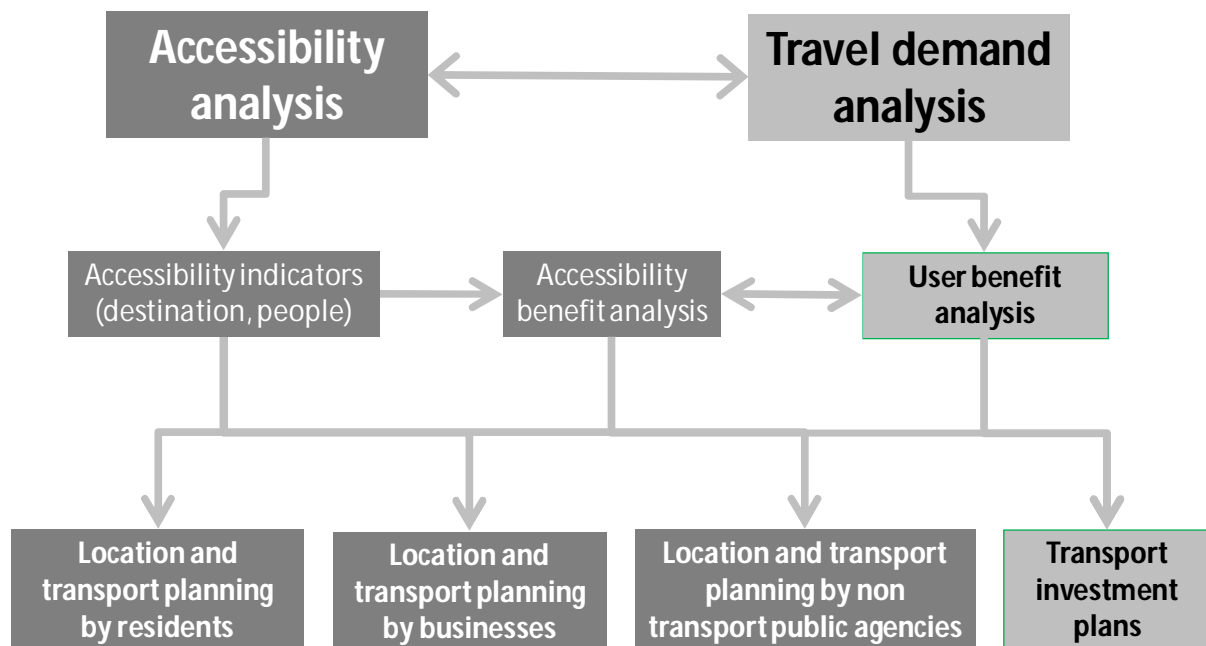
offering competitively priced insurance for young drivers by placing restrictions on high risk activities such as driving after 11pm. Demand for this approach would be heavily influenced by the price differentials between flat rate fuel tax and pay as you go options. Road pricing will not be for everyone but denying people choice artificially constraints growth.

With any of these investment opportunities, delivery in partnership with other relevant sectors can add value if the costs of administering the partnerships are lower than the extra value from shared provision and promotion. Transport programmes developed as part of employability, regional development, health, education and other programmes have been shown to have typically much greater benefit to cost ratios than single sector programmes.

Smart cities programmes describe the transport investment partnerships in Scotland’s most important economic centres as top priorities for the economy. These programmes invest in people and places, plan for resilience, and develop new business models using the latest technology solutions (Scottish Executive 2003). The lack of practical progress does not necessarily mean that these highly ambitious programmes are too challenging to be deliverable. However the transport investment needed for smart towns and cities will not achieve priority within budgets without substantial changes in the ways that planning and appraisal is undertaken. It is not easy to see how travel time savings could represent these benefits, particularly as there would be no trend data from which to project future changes.

Figure 1 shows a framework within which the appraisal using accessibility and travel time analysis can be compared and contrasted to identify the opportunities and choices available for each decision making sector.

**Figure 1 - Reconciling accessibility and travel demand analysis to support location and transport planning by transport and non transport stakeholders**



Comprehensive travel time benefits assessments and accessibility planning assessments will deliver identical answers (Simmonds et al 1998). However there are no practical examples of

comprehensive assessment being achieved with common omissions being inaccurate analysis of land use changes and the location of travel intensive activities, agglomeration and spillover effects (Baradaran et al., 2007), safety and security effects (UoW, 2004), travel information (DHC 2003), traveller skills and capabilities (TAS et al., 2007), and community cohesion.

Decisions on transport spending by businesses, non-transport agencies and consumers account for approximately ten times the transport resources available to transport authorities in the UK (BCSC 2006). Influencing transport investment plans of non-transport stakeholders may be more difficult than focusing narrowly on transport operations and travel time savings, but the rewards of the broader approach are greater given the larger resources available.

## **7. CONCLUSION**

Improving travel choices for Scotland depends on investing in people, places and connections. Economic growth and social development are sometimes associated with increasing travel time and sometimes travel time reductions, so the travel time metric is not particularly useful when assessing many of the investment choices currently facing transport planners. In contrast measures of access to opportunity and choice for each segment of the population show the economic value of transport investment using terminology that partners and users understand.

Accessibility assessments are a much more practical way of describing transport benefits than changes in the value of travel time. It has been suggested that travel time savings would be more accurately described as “the value of accessibility” (Mackie 2008). However travel time is only a proxy for wider economic and social changes for some types of transport investment. The accessibility assessments under the STAG approaches include “community accessibility benefits”. If these were renamed as the “value of transport to the economy and society” it may be that transport appraisal and investment approaches would more effectively support the big challenges that currently face the economy and society.

## **9. REFERENCES**

Atkins 2012. Accessibility Planning Policy: Evaluation and Future Direction - Final Report

British Council of Shopping Centres 2006. Access Information and Flexibility. The Future of Retail Travel. London. [http://www.bpsc.org.uk/publication.asp?pub\\_id=211](http://www.bpsc.org.uk/publication.asp?pub_id=211) (Accessed 5 March 2012)

David Simmonds Consultancy (with ITS, MVA and Oxford Brookes University), 1998. Accessibility as a Criterion for Project and Policy Appraisal. Unpublished Report to DETR, London.

Derek Halden Consultancy, 2003. Barriers to Modal Shift. Final Report for Scottish Executive. <http://www.scotland.gov.uk/Publications/2003/09/18178/26361> (Accessed 5 March 2012)

Derek Halden Consultancy, Institute for Transport Studies University of Leeds, 2007. Skye Bridge Socio-Economic Impact Study Final Report for Highlands and Islands Enterprise.



[http://www.hitrans.org.uk/Documents/Evaluation\\_of\\_the\\_Economic\\_and\\_Social\\_Impacts\\_of\\_the\\_Skye\\_Bridge.pdf](http://www.hitrans.org.uk/Documents/Evaluation_of_the_Economic_and_Social_Impacts_of_the_Skye_Bridge.pdf) (Accessed 5 March 2012)

Geurs, K., Zondag, B., de Jong, G., de Bok, M., 2010. Accessibility appraisal of integrated land-use/transport policy strategies: more than just adding up travel time savings. *Transportation Research Part D* 15, 382-393.

Gordon JE. 1968 *The New Science of Strong Materials: Or Why You Don't Fall Through the Floor*. Penguin.

Halden 1996. *Managing Uncertainty in Transport Policy Development*. Proceedings of the Institution of Civil Engineers.

Halden, D., 2002. Using Accessibility Measures to Integrate Land Use and Transport policy in Edinburgh and the Lothians. *Transport Policy* 9(4), 313-324.

Halden, D. 2003. Accessibility Analysis Concepts and their Application to Transport Policy, Programme and Project Evaluation. In *Transport Projects, Programmes and Policies: Evaluation Needs and Capabilities*. Ashgate. Edited by Mackie and Pearman.

Halden, D., 2008. Citizens, Consumers and the Acceptability of Road Pricing. Proceedings of the Institution of Civil Engineers. *Transport* 161(3), 149–154.

Halden, D., 2009. 10 Years of Accessibility Planning - What have we Learned? Proceedings of the European Transport Conference, Amsterdam.

Head P 2008. *Entering the Ecological Age – The Engineer's Role*. Institution of Civil Engineers Brunel Lecture.

Mackie and Nellthorp 2003. *Transport Appraisal in a Policy Context*. Transport Projects Programmes and Policies. Ashgate.

Mackie P. 2008. Who Knows where the Time Goes? *Transport Reviews* 28:6,692)

Metz, D. (2008) The myth of travel time saving, *Transport Reviews*, 28(3), pp. 321–336.

Social Exclusion Unit, 2003. *Making the Connections: Final Report on Transport and Social Exclusion*, Office of the Deputy Prime Minister, London, UK.

Scottish Executive 2003. *Cities Review*.

Schwanen, Tim(2008)'Reflections on Travel Time Savings: Comments to David Metz',*Transport Reviews*,28:6,709-713

Sugden R 2003. *CBA in a policy context*. Transport Projects Programmes and Policies. Ashgate.

Sugden R. 2010. *Coping with Preference Anomalies in Cost Benefit Analysis*. The Centre for Social and Economic Research on the Global Environment and School of Economic and Social Studies University of East Anglia Norwich NR4 7TJ, UK

UK Treasury, 2003. The New Green Book. London, UK. Available from: [http://www.hm-treasury.gov.uk/d/green\\_book\\_complete.pdf](http://www.hm-treasury.gov.uk/d/green_book_complete.pdf)

University of Westminster, 2004. Crime Reduction on and around Public Transport in Middlesbrough. Final report for the Department for Transport. London. Archived but still available at [http://www.dhc1.co.uk/projects/accessibility\\_crime.pdf](http://www.dhc1.co.uk/projects/accessibility_crime.pdf). (Accessed 5 March 2012).