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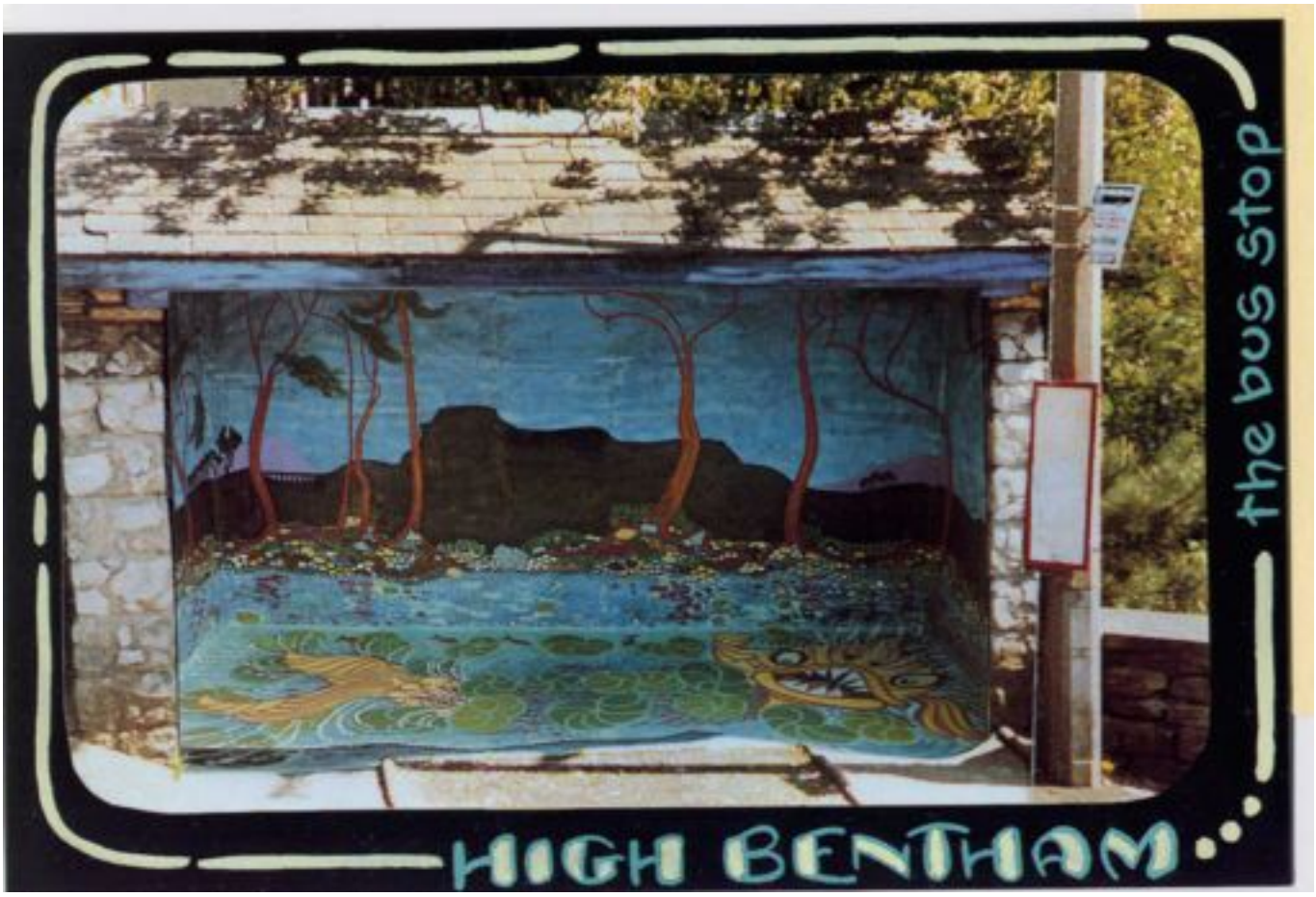

Gill Barron is an artist living and working in High Bentham near Lancaster. With the aid of children from the village, she has painted the bus shelter on a number of occasions. http://www.ipaint.org.uk

Mission Statement

World Transport Policy & Practice is a quarterly journal which provides a high quality medium for original and creative work in world transport.

WTPP has a philosophy based on the equal importance of academic rigour and a strong commitment to ideas, policies and practical initiatives that will bring about a reduction in global dependency on cars, lorries and aircraft.

WTPP has a commitment to sustainable transport which embraces the urgent need to cut global emissions of carbon dioxide, to reduce the amount of new infrastructure of all kinds and to highlight the importance of future generations, the poor, those who live in degraded environments and those deprived of human rights by planning systems that put a higher importance on economic objectives than on the environment and social justice.

WTPP embraces a different approach to science and through science to publishing. This view is based on an honest evaluation of the track record of transport planning, engineering and economics. All too often, these interrelated disciplines have embraced quantitative, elitist or mechanistic views of society, space and infrastructure and have eliminated people from the analysis.

To help it to reach a wide readership, encompassing advocates and activists as well as academics and advisers, WTPP is available free of charge as PDF files on the internet at http://www.eco-logica.co.uk/WTPPhome.html

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The Global Tyranny of Roads: Observations from Mumbai & Melbourne

Nicholas Low & Swapna Banerjee-Guha

At a time when the cracks are showing in the West's economic development (air pollution, climate change, etc.), the developing countries are pursuing the same model which has created social and ecological instability. Be that as it may, economic development, viewed as an increase in use value, is not necessarily at odds with ecological sustainability. Only when economic development is a replica of the Northern model is there a conflict with sustainability in which rich and poor alike suffer the consequences. With these considerations in mind the contemporary conditions and transport policies of Mumbai and Melbourne are compared.

Keywords

Development, globalisation, Melbourne, Mumbai, progress, roads, sustainability

Slow Vehicle Traffic is a more Attractive Alternative to Fast Vehicle Traffic than Public Transport

Gert Marte

Environmental groups usually support the extension of public transport as an alternative to roadway improvement. Public transport is seen as the alternative to vehicle traffic. However, another alternative is to make more efficient use of existing roadway capacity. Only in special cases can public transport be more attractive than slow vehicle traffic. The concept of slow vehicle traffic can be evaluated by cost-benefit analysis.

Keywords

Fast vehicle traffic, induced travel, public transport, speed, slow vehicle traffic

Benchmarking & European Sustainable Transport Policies

Henrik Gudmundsson

Benchmarking is one of the management tools that have recently been introduced in the transport sector. It is rapidly being applied to a wide range of transport operations, services and policies.

This paper is a contribution to the discussion of the role of benchmarking in the future efforts to support *Sustainable European Transport Policies*. The key message is that transport benchmarking has not yet been developed to cope with the challenges of this task. Rather than backing down completely, the paper suggests some critical conditions for applying and adopting benchmarking for this purpose. One way forward is to ensure a higher level of *environmental integration* in transport policy benchmarking. To this effect the paper will discuss the possible role of the so-called Transport and Environment Reporting Mechanism developed by the European Environment Agency. The paper provides an independent contribution to the discussions within the EU-sponsored BEST Thematic Network (Benchmarking European Sustainable Transport) which ran from 2000 to 2003.

Keywords

Benchmarking, BEST, Environmental integration, Indicators, Sustainable Transport

Time to Change the Old Paradigm: Promoting Sustainable Urban Transport in Lahore, Pakistan

Muhammad Imran & Nicholas Low

Urban transport is one of the most important sectors having a direct bearing on sustainable development because of the high growth of the transport sector's energy consumption and greenhouse gas emissions. This becomes more important in the case of Pakistan where the motor vehicle fleet is growing at two to three times the rate of population. Especially in Lahore, designed transport strategies and programs have resulted in high growth of urban road traffic, increasing air and noise pollution, and traffic crashes. The purpose of this paper is to review the adequacy and deficiency of transport planning in Lahore and to recommend some measures for developing a sustainable urban transport system in the city.

Keywords

Guiding Principles and Indicators, Lahore, Pakistan, Proposed Strategy, Sustainable Urban Transport

Local mobility management & urban renewal in public-private-partnership – the example of the 'Car reduced living in an existing residential area at Johannesplatz in Halle/Saale' demonstration

Oscar Reutter

The 'Car-reduced living in an existing residential area at Johannesplatz in Halle / Saale' demonstration is the first attempt in Germany to realise car-free living in an *existing* residential area. It contributes to a more sustainable city and mobility. At Johannesplatz, a local mobility management and urban renewal process has been initiated. The process started with a traffic experiment.

This interim report describes the background, the aim and the approach of the ongoing project as well as the current status of project development. It shows the implemented measures of the traffic experiment, their positive results for environmental quality and the degree of acceptance by the residents.

The main focus is on the successful co-operative planning process of a public–private partnership between the municipality of Halle / Saale and a local housing company. The realised measures have been intensively discussed in a permanent participation process with the people living at Johannesplatz and have been carried out in consensus with them.

Keywords

Car-reduced living, Halle / Saale, mobility management, urban renewal

A very significant thing may have happened on Monday 16th June 2003. A group of ten invited transport experts (The expert working group on sustainable urban transport) met in Brussels to consider the shape of the report that it will be making at the end of this year. They concluded that two issues were of overriding importance and simply had to be progressed if we were to make any progress at all in urban transport in the 25 countries that from next year will make up the European Union. The two issues are:

- Full internalisation of external cost, and
- Terminating the current system of fiscally biased funding for one mode (mainly road building) and replacing it with regionally or corridor based mobility and accessibility strategies.

The first of these is an 'old chestnut' but none the less important for that. Car and lorry transport has become progressively cheaper in real terms over the last 20 years as the industry supporting these modes and the users themselves have benefited from substantial investment in technology and infrastructure and substantial insulation from the 'true costs' of travelling one kilometre by car or carrying one tonne by lorry. The price signals all work in the wrong direction. They emphasise the 'good deal' provided by private motorised transport and in the meantime the alternatives (bus, local rail, bicycle) wither on the vine. The European Union institutions have a long standing commitment to change this by introducing systems of charges and taxes that deliver the 'polluter pays principle' through direct user charges of some kind. Unsurprisingly the policy commitments have not been implemented and the growth in demand for transport continues to be fuelled by massive subsidies.

It is, therefore, very significant indeed that this group has given such a clear message to the institutions of the European Union. The message is simple: there is not much point talking about sustainable transport unless we get the price signals right and bring demand and supply into a sustainable balance. The message is even cruder than this and underlines the importance of getting on with something that is already agreed rather than going round the circuit repeatedly talking about sustainable transport and not doing anything that can deliver this objective.

The second issue is of enormous significance. For years the European Union have put billions of Euro into road building , airports and high speed rail. This is fiscal bias in favour of going faster and going further in an attempt to create a large uniform market where goods and people move around a great deal and movement itself is interpreted as success (the key words are 'free market' and 'integration'). This huge application of tax dollars always generates extra traffic that ends up on a residential street somewhere in Europe and ends up killing people and wrecking the quality of life of hundreds of millions of urban residents. It penalises children, the elderly and those on low incomes. It creates an unequal Europe.

The working group has decided that modally specific budgets (e.g. large road projects in the accession countries and trans-European network projects) should cease and that future budgets should be applied intelligently to regions or corridors looking at all modes, looking at demand management and looking at land use planning. In other words the cash would be applied within an intelligent objective driven and geographical context. Questions like 'how can we reduce car use in City X or region Y or lorry use between city X and city Y' are now on the table with a possibility of funds being applied to measures that can deliver the objective. This is a huge switch of emphasis and a huge change of paradigm. It will probably be killed off at some point. The EU is good at killing off things that might work to bring about sustainability. The Council of Ministers can kill it, the bureaucracy can kill it, Parliament can kill it and the expert group itself might change its mind in October when it meets again. Nevertheless the genie is out of the bottle. A properly constituted group has thought about the core of sustainable transport problems and decided that there are two bullets to bite and they have to be bitten thoroughly and bitten now. This could even end up with 400 million people in the enlarged European Union getting sustainable transport, a better quality of life and a strong local economy. On the other hand this might not be good for big business, the World Trade Organisation or the USA so a way of killing it might have to be found. Watch this space!

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The Global Tyranny of Roads: Observations from Mumbai & Melbourne

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Abstract

At a time when the cracks are showing in the West's economic development (air pollution, climate change, etc.), the developing countries are pursuing the same model which has created social and ecological instability. Be that as it may, economic development, viewed as an increase in use value, is not necessarily at odds with ecological sustainability. Only when economic development is a replica of the Northern model is there a conflict with sustainability in which rich and poor alike suffer the consequences. With these considerations in mind the contemporary conditions and transport policies of Mumbai and Melbourne are compared.

Keywords

Development, globalisation, Melbourne, Mumbai, progress, roads, sustainability

Introduction

There is value in comparing the transport policies of cities in different parts of the world for two reasons that we can term 'global effect' and 'mutual influence'. First, because of its impact on the atmosphere and thus on the global climate, urban transport policy pursued in one city has an impact on cities worldwide. The atmosphere is a closely connected global system. While the capacity of air to move quickly – becoming wind – plays a positive role in dispersing pollutants, that same capacity means that inputs (e.g. from carbon dioxide emissions) at one spot quickly come to affect the whole system, with spatially variable and not easily predictable long term local effects. The significance of recent climate observations is that finite limits have been postulated on the atmospheric-climatic system to absorb such inputs without changing.

Second, transport policy is disseminated from place to place. City planners learn about 'best practice' in their field, and the 'best practice' is mostly defined in terms of the practice of the cities of the economically developed world. Much of the transport policy which is today being implemented in cities around the world has come out of the USA of the 1950s, premised on the assumption that the most advanced and best mode of transport is the private vehicle. European transport policy is today creating a new model based partly on the discourse of sustainability, but also very strongly on intercity movement via rapid transit[1] . Neither of these models is particularly suited to the actual conditions of cities in other parts of the world. Neither model is ecologically sustainable (OECD, 1995; Whitelegg, 2003). Both ultimately create a distance-intensive world in which the costs of individual mobility are borne by society and the environment, and both benefits and costs are very unevenly distributed among local populations.

Such mutual influence is enhanced by economic globalisation. The euphoria of an integrated globalised world has made universal concepts of sustainability – promoted by the international multilateral agencies, such as, the World Bank, IMF or World Trade Organisation – a reality, no matter how different is the development process of the developed countries from that of the less developed ones. Although the field of debate on globalisation is large, complex and rapidly changing, it has become quite clear by now that a market ideology of competition, efficiency and free (sic) trade has been able to influence the framework of policy making worldwide to a great extent. The question of unequal distribution of wealth between rich and poor countries and their historically different paths of development that ought to form the material basis of their political framework and policy making are no longer important. It is also true that the increasing number of multinational corporations that operate across the globe, facilitate not only an intercountry, interlinked

[1] [1] In Goodwin's words the 'new realism' in Europe is: 'an environmentally friendly package, sometimes justified in economic terms, and sometimes by environmental arguments, consisting of *[inter alia]* containment or reduction of the total volume of traffic' (Goodwin, 1996: 8). But this 'new realism' is coupled with the infrastructure policies of the Trans-European Network extending the scope of both road and rail systems to connect cities and regions (EC, 2001).

financial system but increasingly interfere in the political system and governance of such countries. The combined effect of all these influences tends to direct policy into certain channels. While local factors do not remain totally delinked from global factors, the state takes on a powerful facilitator's role – more than a provider's – in contributing towards the smooth functioning of market ideologies. It would be a self-fulfilling analysis to depict the state in such situations as merely powerless to make policy to serve local needs (Weiss, 1998).

These two factors, global effect and mutual influence, taken together suggest that cities and planning worldwide are becoming increasingly interdependent. This being so, there is a need for a higher degree of critical international consciousness and mutual awareness among planners in both the developed and developing world. Planners in the economically developed world ought to consider what sort of model and precedent their polices set for planning in the developing world. Under the present circumstances, urban transport contains a concrete example of Kant's categorical imperative: act in such a way that the maxim of your actions can become a universal law. In other words when you make plans for your urban transport system consider what would happen to the global climate if all cities everywhere in the world were to plan their transport systems on the same principles. If we take a long term view of the consequences of policy, this is also not just a matter of duty along Kantian lines but also of prudence, for the decisions of one city, if applied worldwide, eventually come back to affect the welfare of future populations of that same city.

Planners of the developing world, on the other hand, need to consider whether the models of best practice transport planning to be found in the developed world are really helpful in solving the mobility, health and safety problems of their own cities, and indeed whether the most pressing of those problems are at all the same as those of wealthy cities. There is a belief held by well-meaning people in rich countries that poor countries should be allowed to 'catch up with The North' (or 'The West') by deploying all the same policies 'The North' used to gain its wealth and ascendancy, including the intensive exploitation of fossil fuels. Ultimately, though, this is a paternalistic view which cannot shake free of the belief that the developmental path followed by 'The North' is the only path worth having – and this is to say nothing of the legacy of colonialism. It is also somewhat self-serving since, if the developing world merely follows the same developmental path, 'The North' can further enrich itself by feeding into and taking from the economic systems thus created.

From the viewpoint of ecological sustainability it must of course be understood that the world's poorer cities use much less *per capita* of the world's environmental resources than the rich cities. But that does not mean that poor cities therefore ought to consume more. If there is a way of improving the living standard of the poor while continuing to consume less resources then it is in the economic as well as environmental interest of the developing world to pursue it. Economic development, viewed as an increase in use value, is not necessarily at odds with ecological sustainability (von Weizsäcker *et al.*, 1997). Only when economic development is a replica of the Northern model is there a conflict with sustainability in which rich and poor alike suffer the consequences.

With these considerations in mind we turn to the contemporary conditions and transport policies of two cities of the South: Mumbai in India and Melbourne in Australia[2]. They are cities with different transport profiles, different cultures and at different stages of economic development. Melbourne is rich (annual metropolitan GDP: US$21,476 per person), Mumbai poor (annual metropolitan GDP: US$913 per person); Melbourne is a sprawling low density city, Mumbai has a very high population density. In Melbourne most people travel by car, in Mumbai most people travel by public transport or on foot.

Mumbai & Melbourne: transport profiles

Mumbai is the commercial capital of India and capital of the State of Maharashtra. In contrast with all other Indian metropolitan cities, the suburban (surface) railway is the most developed public transport facility, carrying 40% of trips by motorised modes. During peak hours public transport carries 83% of all passengers. The remaining 17% are carried by intermediate public transport (taxis and auto-rickshaws) and private transport (cars and two wheelers), accounting for 8% and 9% respectively.

Melbourne is the second largest city in Australia and capital of the State of Victoria. The form of the city was strongly influenced by the deployment of the (mostly surface) suburban railway system but this system now carries only about 2% of all trips. Tramways offer an alternative public transport service in the inner and middle suburbs

A comparative profile of the two cities in terms of transport sustainability can be gained from the Millennium Cities Database assembled by Kenworthy

[2] 'The North' and 'The South', though currently standing for 'developed and developing' or 'rich and poor' are of course geographically inaccurate. It is worth remembering that 'The South' contains some relatively wealthy, 'developed' cities such as in those of Australia and New Zealand and to some extent Argentina and Chile. While Mumbai, a poorer, developing city, geographically speaking is in the Northern hemisphere.

Table 1 Selected metropolitan characteristics of Mumbai & Melbourne

Characteristic	Mumbai	Melbourne
Urban density (Persons/hectare)	337.4	13.7
Length of road in metres per urban hectare	116.8	130.4
Length of reserved public transport routes in metres per urban hectare	16.2	229.4
Passenger cars per 1000 people	21.2	593.7
Motor cycles per 1000 people	32.2	11.6
Taxis per 1000 people	10	1
Passenger cars per kilometre of road	61.2	62.3
Modal split: Non-motorised modes of transport	49.8%	19.1%
Modal split: Motorised public modes	40.9%	7.1%
Modal split: Motorised private modes	9.3%	73.8%
Percentage of metropolitan GDP spent on public transport investment	0.08%	0.16%
Percentage of metropolitan GDP spent on road investment	0.24%	0.58%
Total pollution emissions in kilograms per capita	31.9	189.7
Total transport deaths per 100,000 people	9.3	7.7

Source: Kenworthy & Laube (2001) The Millennium Cities Database for Sustainable Transport

and Laube (2000). The Millennium Cities Database contains a mass of comparable information about the land use and transport characteristics of cities in the year 1995. Table 1 (below) provides a data series that shows some important differences and similarities between the two cities in this study.

First, the urban population density of Mumbai was some twenty four times that of Melbourne. Urban density is a somewhat contentious measure depending as it does on what is included as 'urban'. Here the urbanised area is the sum of the areas taken up by the following land-uses including: residential, industrial, offices, commercial, public utilities, hospitals, schools, cultural uses, sports grounds, wasteland (urban), transport facilities, and small parks and gardens. The same method of measurement has been applied to the two cities.

Second, it is evident that Melbourne had a much more extensive public transport infrastructure network than Mumbai. Whereas the length of road per urban hectare was not very different in the two cities (Melbourne had about 12% more road space than Mumbai), the length of reserved public transport routes in Melbourne was some 14 times that of Mumbai. Mumbai had three times as many taxis and ten times as many motor cycles (per capita) on the roads as Melbourne, but Melbourne had about twenty eight times the number of cars per person. Here however we encounter an important similarity. Both cities had nearly the same numbers of cars per kilometre of road. So the contribution private passenger cars made to congestion was about the same in the two cities.

Third, the modal split between motorised and non-motorised, and between public and private motorised modes of transport showed very significant differences. In Mumbai nearly half of all journeys were by non-motorised transport compared with under one-fifth in Melbourne. Another 40.9% of trips used public motorised transport in Mumbai compared with 7.1% in Melbourne. Whereas 73.8% of trips were by public transport in Mumbai compared with just 9.3% in Melbourne. Thus, although Melbourne has a much more extensive public transport system than Mumbai it is less used. In Melbourne about twice as much of the metropolitan GDP is spent on both roads and public transport as in Mumbai. Melbourne generates a much higher poisonous pollution load per capita than Mumbai, though, because it is spread over a larger area it is much less concentrated. More people die from causes directly attributable to transport (accidents) in Mumbai than in Melbourne. This does not include deaths from pollution related disease. The Millennium Cities Database does not include a direct measure of greenhouse gas generated from urban transport but overall energy use (produced mostly from fossil fuels) per passenger kilometre can be regarded as a surrogate. The figure for Melbourne is 2.47 megajoules per passenger kilometre compared with 0.39 for Mumbai. Thus, on this basis Melbourne produces six times more greenhouse gas per passenger kilometre than Mumbai.

On the basis of these figures a sustainable transport policy for both cities would concentrate policy

attention on public transport. Mumbai's very high population density and existing public transport ridership levels suggests the need for very high priority to be given to investing in a rapid, non-polluting, public transport infrastructure. This does not have to be a rail system. As Arif (2002) has argued for Jakarta (Indonesia), a dedicated busway system along the lines of the Curitiba system would do the job at much less financial cost. It is also probably fair to say that a road-based transport system cannot work in such a high density city as Mumbai. It will simply lead to unbearable pollution and congestion. Melbourne, on the other hand, already has such an infrastructure. Road congestion can be relieved and greenhouse gas emissions reduced by attracting more people to use it. For this to happen, as Mees repeatedly argues, policy attention must be directed to providing a seamlessly connected, high quality and fast co-ordinated bus, tram and train service. In Mumbai and Melbourne, however, policies have been focused on roads as the following more detailed analysis shows.

Transport policy in Mumbai

In the 1980s polluted air in Indian cities could be traced to emissions from factories. By the 1990s the major contributor to the haze and poison in the air was no longer the factories but automobiles (Sharma, 2000). Since the 1990s there has been a strong policy thrust to channel private investment into the country's road transport sector, and consequently, throughout urban India, especially in the large cities, there is growing dependence on private modes of motorised transport (D'Monte, 2001). These private modes contribute most to air pollution – 78% from two wheelers and 11% from cars (Patankar, 2000).

Sustainable Cities Policy introduced prior to the New Economic Policy emphasised ecological modernisation – self reliance, the use of market mechanisms, city redesigning, increased energy efficiency and livability. Urban environmental problems were generally viewed through a Northern (developed world) perspective, having narrow environmental concerns, while the basic mobility needs of the majority were neglected (Satterthwaite, 1998). Under the Structural Adjustment Programs (SAP) and New Economic Policy (NEP) this tendency has been aggravated by private investment indiscriminately directed, especially in cities like Mumbai, to various programs of urban infrastructure. These have led to further congestion and pollution, in addition to increasing commercialisation and privatisation of the key urban economic sectors (Mahadevia, 2001).

Transport policy is thus torn by a three way contradiction arising from the response by government to the globalisation agenda, the pressing social need to provide better transport for the general public, and interpretations of 'sustainability' in terms of ecological modernisation. A motorised transport agenda is being promoted as a solution to transport need while the cause of 'sustainable cities' interpreted by affluent sections of society systematically overlooks people-centred approaches and excludes the welfare concerns of the poor. Far from a harmonious 'triple bottom line', environmental, social and economic sustainabilities are in strident conflict.

Contemporary transport planning in Mumbai reflects the above contradictions. While programs are being undertaken for developing or improving mass transit at governmental levels in the public sector, the liberalisation agenda of the same governments nullifies such efforts by vigorously promoting road-based, privatised, vehicular transport projects in complete disregard of environmental requirements. The powerful roads lobby of Mumbai, a feeder group of the national lobby enjoying considerable state support under the New Economic Policy, is instrumental in pushing forward projects that aggravate environmental degradation of the city and deterioration of the health of its residents.

Since the initial years of national planning, the transport network of Mumbai has been the responsibility of the public sector. The number of organisations and agencies sharing the responsibility for construction, design, operation and maintenance of the transportation services are many, almost thirteen in number, having amongst them a fragile co-ordinating network. Some of them, like the Maharashtra State Road Development Corporation, even though it has been incorporated as a limited company in 1996 under the Indian Companies Act, is fully owned by the Government of the State of Maharashtra.

The Greater Bombay Development Plan of 1973 (BMRDA, 1973) envisaged a multi-nodal structure for the Bombay Metropolitan Region having New Bombay and Kalyan as major regional growth centres. By then already the road and suburban rail networks had followed the alignment of the colonial transport infrastructure. The extended rail network has five rail corridors, two on the Western and three on the Central Railway, running about 2000 trains per day. Similarly the road network has three main north-south corridors, the Western, Central and Eastern, the latter carrying the heaviest truck traffic. Actually the road network of Mumbai is organic in nature, constructed before the advent of automobiles. The north-south alignment of transport infrastructure was dictated by the city's physiography but it serves all the traffic heading towards the 'Central Business District' located in the extreme south.

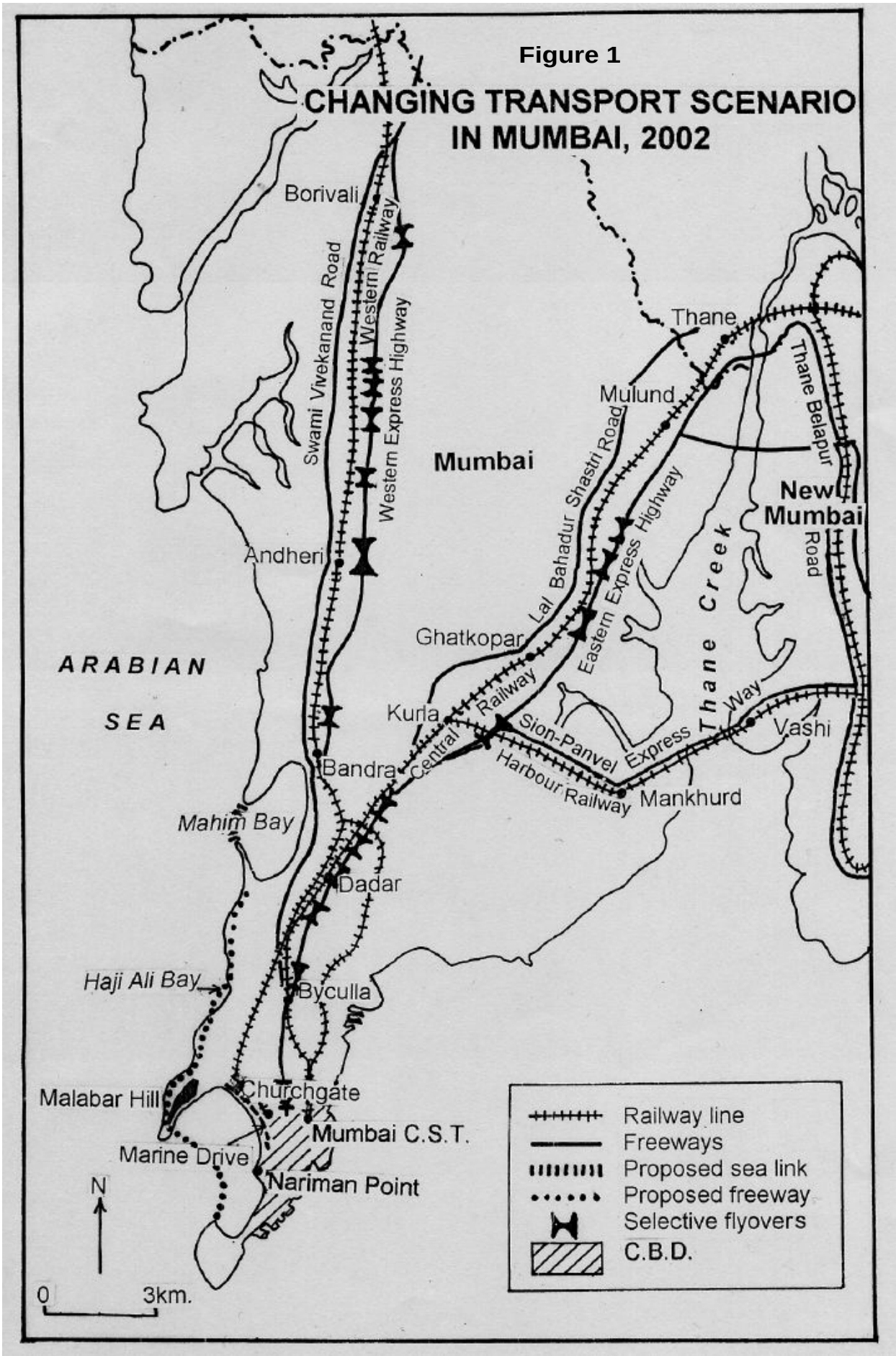
Figure 1
CHANGING TRANSPORT SCENARIO IN MUMBAI, 2002
Borivali
Swami Vivekanand Road
Western Railway
Western Express Highway
Thane
Mulund
Thane Belapur Road
Mumbai
New Mumbai
Lal Bahadur Shastri Road
Eastern Express Highway
Thane Creek Way
Andheri
Ghatkopar
Kurla
Central Railway
Sion-Panvel Express Harbour Railway
Vashi
Mankhurd
Bandra
ARABIAN SEA
Mahim Bay
Dadar
Haji Ali Bay
Byculla
Churchgate
Malabar Hill
Mumbai C.S.T.
Marine Drive
Nariman Point
N
0
3km.
Railway line
Freeways
Proposed sea link
Proposed freeway
Selective flyovers
C.B.D.

In the mid-1980s, with the launch of the Maruti - 'the common man's car', vehicle ownership increased in all Indian cities, especially Mumbai. The road lobby for the first time gained ground, promoted by easy finance from non-banking financial companies to make personal ownership of motor transport easier. The resultant expansion of the domestic car market led to a steep rise in the number of vehicles in Mumbai, bringing pollution and environmental deterioration in its wake.

Problems of transportation in Mumbai result partly from its unbalanced urban land use pattern. The initial concentration of commercial, finance and office sectors in the southern tip of the metropolis followed a colonial design which was never critically questioned nor reconstructed later with a multi-nuclear pattern. Rather, the strong nexus of state, industrial and commercial capital, later supported by the builders' lobby, has persistently worked towards intensifying the use of land in Southern Bombay, aggravating the pressure on transport and other related infrastructure.

The two key comprehensive studies with wide ranging proposals on transport development in Mumbai were Wilbur Smith and Associates (1981) and W.S. Atkins (1994). In between these studies various federal and State government departments and private consultants' groups have written about the need for east-west road links and free passageways at vital intersections of the express highways in the north-central and north-western parts of the city. Interestingly, none of the studies advocated any major road improvements in the southern part of the city because of the high cost. In all these reports the needs of pedestrians were by and large ignored while the demand for personal vehicular traffic was especially highlighted.

The first Bombay Urban Transport Project (BUTP[3]) undertaken in 1977 and completed in 1984 at a cost of Rs. 390 million with a World Bank loan of US$25 million focused on the bus network, leading to the construction of a number of highway flyovers (grade separated interchanges). The second phase of the BUTP (BUTP II, later MUTP II), begun in 1985, also had the objective of enhancing the capacity, efficiency and financial viability of the urban transport system in the Bombay metropolitan region, particularly the mass transit system with suitable policies and appropriate investment in public transport infrastructure. Following this study, rail improvement initiatives were geared up in the form of improvement of the existing rail system and its simultaneous expansion to newer areas. Even though a road link had already been constructed between Mumbai and New Bombay in 1973, the much awaited railway link and a proper road bridge were only established during the 1980s. Simultaneously, extensive rail improvement works were undertaken on the Western, Central and Harbour lines at different locations throughout the city. Social problems, however, surfaced in the large scale displacement and marginalisation of innumerable poor families from near the railway track, whose rehabilitation became the reluctant responsibility of all the concerned organisations.

Contradictions of globalisation and liberalisation followed. During the late 1990s there was a drastic alteration of course by the liberal government through initiation of a range of road schemes opting for private, motorised transport in preference to public transport. The hidden agenda of MUTP II (Mumbai Urban Transport Project, 1998) now surfaced. In the late 1990s, falling in line with the dictum of the New Economic Policy, the State Government, bypassing the apex planning body of Mumbai, the MMRDA (Mumbai Metropolitan Regional Development Authority) entrusted both the planning and execution of the road projects to the Maharashtra State Road Development Corporation which had no expertise to take up the jobs. The total cost of all these schemes, was over Rs. 80 million. Even W.S. Atkins, consultants hired by MMRDA to advise on a comprehensive transport plan for the metropolitan region in 1994, expressed the view that Mumbai was unique in its emphasis on public transport that carries 83% of all passengers during peak hours. The remaining 17% are carried by intermediate public transport (taxis and auto-rickshaws) and private transport (cars and two wheelers), accounting for 8% and 9% respectively. In the contemporary transport programs of Mumbai this 9% of the transport market has received all the attention (D'Monte, 2001).

The three major pillars of the contemporary transport programs in Mumbai are

1) flyovers,
2) sea links, and
3) freeways,

all encouraging personal motor vehicle traffic. Fifty flyovers are being constructed all over the city. Space underneath some flyovers is even being allocated for commercial use, thus negating the prescribed benefits of relieving congestion on the road. While the State Government systematically projects flyovers as the ultimate solution to the problem of congestion and vehicular pollution, vehicles plying at a higher level and speed aggravate pollution of the adjoining residential buildings and create conditions for more cars to come. They use more road space, leaving a much smaller road area for public transport, such as buses which are forced to resort to lower speeds. The latter cannot use the flyovers being constructed at major road

[3] Full information on BUTP and MUTP is available at http://www.mmrdamumbai.org/projects.htm

intersections, because bus stops are provided only on the local main roads.

Even the World Bank, the principal funding agency of MUTP I and II, has criticised the flyovers for their negative impact on the environment (noise and air pollution), public transport and affordability for the general public. Several committees (TCS, 1998) have expressed negative views about the flyovers. Citizens' groups have fought in the courts against the institution of tolls on the flyovers, but the legality of tolls has been upheld by the Mumbai High Court. Following this court victory, the State Government has started charging tolls on the entry point flyovers to the city, which is again discriminatory (D'Monte, 2001). The entire financial burden of the flyovers has thus come to rest on the State Government which would raise the necessary funds through public tax – for the benefit of a meagre 9% of all road users.

The second pillar, the proposed 4 km long Worli Bandra sea link, aiming to reduce the time distance for vehicular traffic, has come in for serious criticism from environmental groups. More than 100 acres of land have already been reclaimed and a few hundred acres await reclamation, and one wonders why it is promoted as a sea link. Prospective displacement of the fishing community in the adjoining Mahim Bay, and the endangered ecosystem due to the possible loss of mangroves are associated sore points. As people are not allowed access to the plan documents of the present link and the future extensions, the Indian People's Tribunal decided to hold a public hearing on the issue. All the erstwhile committees appointed to scrutinise the merit of the link have gone against it and indicate that it would add to serious traffic congestion in a large area of South Mumbai.

The most controversial road project in Mumbai comprises the third item, the freeway project, recommended by Wilbur Smith in 1981. It is interesting to note that recommendations that were shelved then are now being revived with considerable fanfare as modern urban development projects. A fifteen kilometre road which envisages a bridge from Worli across Hali Ali Bay, a coastal freeway up to Malabar Hill and a third bridge across the bay at Marine Drive to Nariman Point, all located in Southern Mumbai, are the major facets of the project. By contributing to further congestion and slowing car speeds in South Mumbai (the average car speed has already decreased from 20 kmh in 1993 to 12 kmh in 1997) and encouraging more car traffic into the area, it is difficult to see how this project will help the majority of the public.

A recent City Transport Scheme for Mumbai jointly formulated by Central Government (Railway), State Government, Bombay Electric Supply and Transport (BEST) and the City Police has suggested reasonable and sensible measures for improving the suburban rail service, including introducing air-conditioned coaches to cater for the affluent class. Road widening, footpath construction and maintenance, underground crossings, subways under bridges and improvement of the road traffic signalling system are their additional suggestions. Finally, provision of adequate finance, according to this group, is fundamental to the success of all the programs. The major thrust of such policies is always the strengthening of suburban railways and public road transport.

Transport policy in Melbourne

If current performance continues, it has been estimated, by 2010 in the transport sector Australia will record a 67% increase over 1990 in greenhouse emissions to the atmosphere, with by far the largest contribution coming from road use (Allen Consulting Group, 2000, 62). This is not the projection of a 'green' NGO but of a consultant hired by a conservative State government. Recall that the Kyoto agreement generously allowed Australia an 8% increase in emissions overall by 2012. Australia's cities, and Melbourne in particular (quite contrary to the policies proposed in Agenda 21 at the 1992 Rio Earth Summit) have seen continuous building of freeways with flyovers, a policy that adds vehicle traffic to the transport system and reduces the viability of public transport (see SACTRA, 1994). Globalisation, with its ideology of privatisation and private transport, has certainly in recent years helped along road based solutions, but the power of the road engineers and the road lobby and their grip on the imagination of the general public was already firmly established before the current round of globalisation began in the late 1970s.

The system of urban governance which prevailed in Australia up to the 1980s was one in which the task of building and running transport infrastructure was divided among a number of single purpose statutory State Government authorities. Separate authorities handled tramways, trains and roads. By the 1950s an extensive system of suburban railways had made possible a spacious low density city organised along radial corridors of movement. The task of metropolitan planning was also treated as a single purpose task and given to the Melbourne Metropolitan Board of Works (MMBW).

American examples provided the model for 'modern road practice': divided highway, restricted access and grade separated interchanges. The MMBW (1954) produced a metropolitan plan and a schedule of twelve urgent major road improvement projects in 1957 which included a city ring road, freeways and by-passes (Dingle & Rasmussen, 1991, 243). In the 1960s, with the active intervention of the State Premier, three

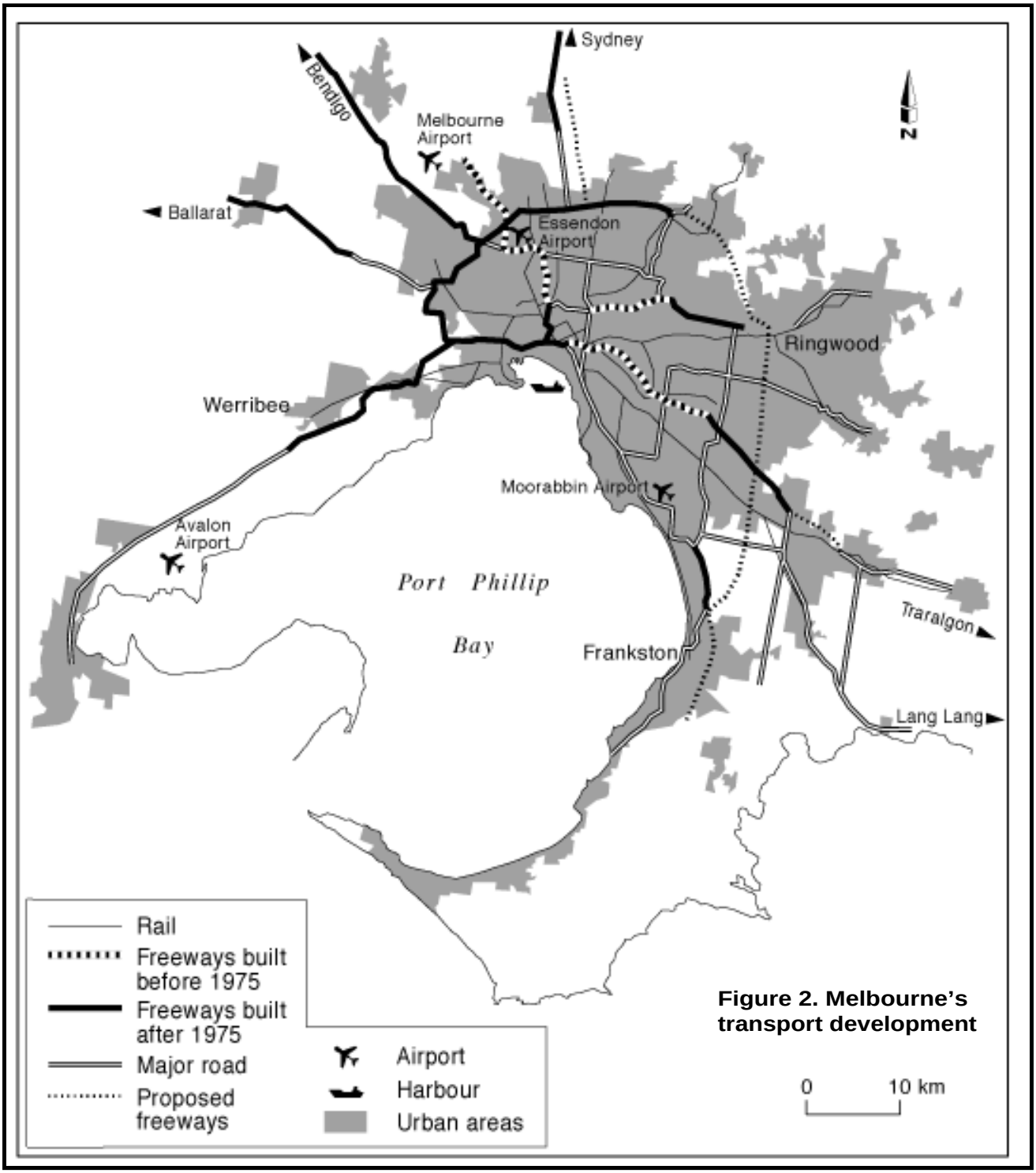

Figure 2. Melbourne's transport development

radial freeways were built (South Eastern, Eastern and Tullamarine connecting the city to Melbourne airport). There was much public protest, local government disquiet, and press campaigns against freeway construction (*ibid,* 251). A planned inner ring motorway, drawn tightly around the CBD, was the target of particular concern.

In 1963 a committee of senior bureaucrats, (the Metropolitan Transportation Committee) was convened, and commissioned a transportation study by the American consultancy Wilbur Smith and Associates working with a team of local engineers. These consultants published the 'Melbourne Transportation Study' in 1969 (MTC, 1969), which closely followed the lines of the Chicago Area Transportation Study and recommended a grid of freeways, at between 6 and 8 kilometre intervals, to meet Melbourne's transport needs up to 1985. This freeway plan was adopted in full by the MMBW and the main infrastructure proposals were included in its report 'Planning Policies for the Melbourne Metropolitan Region' (MMBW, 1971) which was then opened to comment.

The reaction was rapid and furious. Inner suburbs, parts of which were once designated 'slums', were increasingly attracting young energetic gentrifiers who

now found that the quality of their environments was to be destroyed by the construction of vast new roads and interchanges. From 1969 local residents campaigned to stop the Eastern Freeway through the Yarra river valley 'with petitions, deputations, leaflets, rallies, paid advertisements in the press, trade union bans, vigils and whatever else they could think of' (Anonymous Authors, 1977) – but to no avail; the freeway was built. Residents' campaigns, however, with 'public meetings attracting thousands of people' did force the State Premier (Henry Bolte: Liberal Party) to eliminate the eastern section of the inner ring road (Rundell, 1985, 13).

Under pressure of public outrage and facing an election in 1973 a new State Premier (Rupert Hamer: Liberal Party) announced that the proposed freeway network would be halved and the most controversial inner urban freeways dropped: 'freeways would be banished to outer suburban and country areas and greater emphasis placed on public transport' (Anderson, 1994, 244). A new battle erupted in 1975 against a plan to link two freeways down a creek valley used for recreation. The attitude of the chief engineer of the road building authority (the Country Roads Board) was revealed in a leaked confidential memo which stated that the freeway would be built 'and therefore as far as the proposed study is concerned government objectives do not really matter' (Country Roads Board 1975, 2).

The action of cutting the inner heart out of the freeway network and leaving outer elements intact inadvertently gave the engineers a potent weapon in a radially organised city. Congestion inevitably built up in the gaps between freeways, creating demand for relief. Mees reports that the new Labor State government elected in 1982 'was gradually worn down by the persistence of the bureaucratic road lobby, rising road traffic and public transport deficits' (Mees, 1999, 148). Against continual local opposition Labor constructed new links between freeways (renaming them 'arterials'). Labor's metropolitan planning policy of 1987 incorporated, without additional analysis, the main radial and outer urban freeway routes from the 1971 MMBW plan (based on the 1969 Melbourne Transportation Study).

The 1969 Melbourne Transportation Study had not included a freeway traversing the environmentally sensitive zone in the north-east known as the 'green wedge', not because of any particular sensitivity to environmental values but because there was little observable demand for a motorway. In the 1970s, however, the road building authority (now the Country Roads Board), had been allowed to conduct investigations into an outer ring road, and had drawn up detailed plans for such a road – only to meet with vocal opposition from a local well organised environmental group, the Anti Ring Road Organization (ARRO). These plans, coincided neatly with the planning ministry's fictitious eastern 'concentration of activities'. As part of its commitment to filling in some of the outer freeways proposed in the 1969 plan, Labor approved a circumferential freeway through Melbourne's western industrial belt and an extension of the radial eastern freeway. In fact most of the additional freeways built under Labor had already been discussed in a draft 'Five Year Plan' issued for discussion by a committee of bureaucrats in 1978 – four years before the Labor party assumed office (State Co-ordination Council, 1978). In 1992 the Labor government called for tenders for construction of a privately financed major expansion of the radial freeway system (including the Western portion of the 1957 inner ring road) which was named by the succeeding Liberal government 'City Link'.

Labor lost to the Liberals in 1992. By then international investment in infrastructure had gained ground in Australia and engaging private capital in BOOT (Build-Own-Operate-Transfer) projects offered a new way to fund roads. A massive expansion of the existing freeway system was conceived using electronic tolling to provide an income flow to the private operators. Dubbed City Link, this private freeway development became associated with the 1990s Liberal Government's high risk policy style, but the unpopularity of placing a toll on existing roads ultimately led to the government's loss of the 1999 election. City Link doubled road space on about 16 kilometres of existing freeway, constructed a bypass around the CBD (the Western section of the inner ring) and two tunnels under parkland and the Yarra River, with exhaust towers rising in residential areas. The project was by far the largest BOOT scheme in Australia. Two existing freeways, already paid for by the community, were handed over to the private tollway operator. The financial structure of City Link, which cost more than AUS$100 million in consultancy fees to create, included a remarkable exercise in 'creative' accounting. The private operator is required to pay the Government of Victoria a total of AUS$2.8 billion in annual concession fees over the life of the project. But the company may pay these fees in valueless concession notes – essentially IOUs – at the end of the 34 year life of the project.

Under the Liberal Government (1992-1999) the western section of the ring road was completed, City Link was implemented, the extension of the Eastern Freeway was constructed, and plans were advanced to build the eastern section of the outer ring road. The surprise loss by the Liberal Party of the 1999 election has changed nothing. The Labor Government moved quickly to build a further extension of the Eastern Freeway, tunnelling under part of the environmentally

sensitive and beautiful Mullum Mullum creek – once again against the strong opposition of a local citizens' group. When this extension is built, pressure will grow rapidly to relieve traffic congestion at the city centre end of the freeway by completing the inner urban ring road, linking the Eastern freeway to the City Link system by a tunnel under Melbourne Cemetery and Royal Park. Having promised before the election not to build the outer ring road, the new government changed its mind and approved construction of the eastern section of the ring road.

The counterpart of the strength of purpose of the road engineers was the organisational inadequacy and managerial incompetence within the public transport system. Mees (1999, 149) has argued that the real weakness of public transport is the 'poor service quality and lack of integration, arising from an overall lack of planning'. As Mees points out, the problem was recognised by the MMBW in the 1950s but the post-colonial structure of governance was one of functional fragmentation. So 'it was not until 1983 that a single authority was established to run public transport and that body never even attempted to integrate the different modes of transport' (*ibid,* 151). There was no question of integrating the purposes of public transport with those of roads – inquiring, for example, whether an improvement of public transport service might help relieve road congestion and improve connectivity, or of comparing the costs and benefits of new public transport investments with those of new road investments. The break up and privatisation of the management of all Victoria's public transport in the late 1990s has brought only small improvements in peak hour service on some rail lines at the expense of less popular lines and times. The tram and bus service has generally declined. Integrated planning of a privately managed and operated public transport system is not impossible but such a task has not yet been contemplated by the Government of Victoria.

The latest metropolitan strategy produced in 2002 by the Labor Government gives some cause for hope, not because there is a well thought out plan to manage transport and infrastructure differently from the past, but because the new plan cannot succeed without such planning. It is proposed to accommodate further growth of population and households within the existing urban boundaries, creating a multi-centred 'compact city' based around a large number of commercial and service nodes, Nearly a million people living in 620,000 new households are expected to be added to metropolitan Melbourne over the next thirty years (Department of Infrastructure, 2002, 14). They are to be accommodated within existing corridors and within a permanent 'urban growth boundary'. The largest share of new households (69%, 425,000 households) is to be housed within the existing metropolis – 41% in 'strategic redevelopment sites' in activity centres, and 28% dispersed throughout the urban area. If this occurs at the same time as a roads-based solution to transport in the city is pursued, the result will be rapidly increasing congestion and pollution. The alternative, however, a public transport solution, requires a major shift in funding priorities which will be hard to achieve.

Although the Labor Government was re-elected in November 2002 with an unprecedented landslide majority it remains to be seen whether a new politics of transport based on human and environmental need will develop. Political influence on transport policy since 1973 has been feeble. Policies have simply been rolled on from one administration to the next, whatever the political party in power. While the spin different politicians have placed on the policy has varied, politicians have followed wherever the road engineers have led. The most striking aspect of the discourse of road building in Melbourne is the almost complete absence in official documents of a sense of debate. Well informed and expert opposing voices, such as that of the Public Transport Users' Association and the many community organisations opposed to road building are rendered silent, their presence invisible in official documents.

Discussion & concluding remarks

A new turn in the globalisation of capital occurred in the last quarter of the twentieth century. As a result, international policies increased their emphasis on foreign investment (facilitated by international aid agencies) to enhance 'development' in poor countries. Stiglitz (2002, 67) observes:

> 'Foreign investment is not one of the three pillars of the Washington Consensus, but it is part of the new globalization … Privatization, liberalization, and macrostability are supposed to create a climate to attract investment, including from abroad. This investment creates growth. Foreign business brings with it technical expertise and access to foreign markets, creating new employment opportunities.'

Thus is the technical model of development of the American socio-economic paradigm exported to the world. But in reality the dissemination of this paradigm is not new. Melbourne accepted it in the 1950s before the Washington consensus was conceived and without the coercion of international aid. Mumbai is now following the same path. Mumbai and Melbourne, different in so many ways, are linked by the acceptance in both cities of transport policies derived from the USA.

The classic model of transport planning is 'predict and provide' – find the trend in the use of different modes of urban transport and provide the infrastructure to facilitate that use. 'Predict and provide' seemingly

justifies funding for roads so long as a positive trend in private vehicle use can be discerned. This is so whatever the needs of the community, whatever the existing level of use of the public transport system, and whatever the consequences for public health and social and ecological sustainability of building more roads. It also has the advantage for promoters of road building of having a circular causality. Building roads induces traffic which increases the trend to private vehicle use (SACTRA, 1994). This paradigm is powerfully associated with the economic benefits allegedly associated with investments in roads – public transport funding is normally described as 'expenditure' while funding for roads is described as 'investment' (Vigar, 2002: 165). This paradigm has given rise to similar priority being given to road building in a city where most personal movement takes place on foot or by public transport (Mumbai) and in a city where personal movement by car is the overwhelmingly dominant mode and an extensive public transport infrastructure is underused (Melbourne).

The consequences for Melbourne of continued road building and unbalanced funding for roads over urban public transport are either increased congestion or further dispersal of the urban area, and possibly both – the development of an 'edge city' along American lines. This future conflicts violently with ecological sustainability, with what many people in the city desire, with increased public transport use, and with contemporary plans for Melbourne's future. The consequences for Mumbai, besides the 'edge city' fall-outs in the Worli and Bandra-Kurla complex areas, are far more severe. Without massive dispersal of the urban area and reduction of the population density to levels corresponding with Melbourne's there will be devastating pollution, absolute gridlock, and social devastation: an economic, social and ecological nightmare.

If transport solutions are to be found to the immense problems of developing cities – many growing at alarming speed – the decision makers of 'The South' will have to become more discriminating about what they buy from 'The North'. The South must develop its own approach to transport planning, training experts within their country of origin and feeding back into the global public knowledge base. But even if reliance on outside experts imported from the developed world is reduced, knowledge will continue to flow and the problem of inappropriate transfer of technology remains a very real one.

The U.N. Conference on Human Settlements in 1976 (Habitat) prioritised public transport for developing countries. The aim was to achieve the maximum benefit for the majority with the least transport-related degradation of the environment and optimum protection of non-renewable resources. The idea was reiterated in the 1992 Rio Earth Summit through an agenda to integrate sustainable human settlement development with transport programs favouring high occupancy public transport. In spite of such long standing advocacy for public transport, many developing countries, including India, have failed to formulate effective policies on urban public transport. Mass transport services cannot keep pace with the steep rising demand in large cities of these countries resulting in a proliferation of personalised modes of motor transport (the rate of growth of private vehicles being 10 – 15% per annum).

Urban transport policy in India is neither strong enough to self-finance its development to meet the existing demand, nor is it sufficiently supported by the Government to deliver goods for the welfare of the larger section of the urban population. With scant attention to the question of sustainability of cities, transport policies in India have never adopted an inter-sectoral approach with an optimum mix of options related to capital investment and management-oriented actions. The resultant incapacity of urban transport in meeting the objectives of socio-economic development as well as urban sustainability has by now become a grim reality.

The 'predict and provide' paradigm of trend planning should be abandoned immediately. Instead planning should proceed from a long term ecological, social, and economic vision of the city of the future (Vuchic, 1981). Essentially three basic questions surface with regard to transport planning in both Mumbai and Melbourne.

- First, what should be the indispensable level of transport provision for the city to meet the welfare objectives of serving the majority and, therefore, what kind of transport infrastructure would be needed within the limits of resource use?
- Second, how should the city's transport sector be managed to be self-sustainable without undermining the sustainability of other sectors of the economy?
- Finally, how would the organisation of human activities add to the sustainability of the city's transport, impact on human health and its demands on non-renewable resources (Patankar, 2000)?

All these issues can be addressed positively if each city's transport planning agenda is strongly committed to a public transport system taking an 'inclusive approach'. In the past the flow of ideas has tended to be unidirectional – from the 'developed' to the 'developing' world. But this is not a necessary consequence of globalisation. If Indian cities develop their own model (as happened in Curitiba, Brazil) the flow of ideas might well reverse, with great benefit to all nations.

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Slow Vehicle Traffic is a more Attractive Alternative to Fast Vehicle Traffic than Public Transport

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Abstract

Environmental groups usually support the extension of public transport as an alternative to roadway improvement. Public transport is seen as the alternative to vehicle traffic. However, another alternative is to make more efficient use of existing roadway capacity. Only in special cases can public transport be more attractive than slow vehicle traffic. The concept of slow vehicle traffic can be evaluated by cost-benefit analysis.

Keywords

Fast vehicle traffic, induced travel, public transport, speed, slow vehicle traffic

Introduction

Environmental groups usually support the extension of public transport as an alternative to roadway improvement. Public transport is seen as the alternative to vehicle traffic. However, another alternative is to make more efficient use of existing roadway capacity.

It is usually assumed that the No Build option leads to gridlock, if demand exceeds capacity. This is wrong. Limiting capacity leads to a speed reduction and the majority of car users decrease their length of trips. Only a minority change to public transport. The reason for that is quite simple. Even if speed is reduced, vehicle traffic usually remains faster than public transport. The most attractive alternative to fast vehicle traffic is usually slow vehicle traffic and not public transport.

Measurements and traffic models based on such measurements show that slow vehicle traffic is in the majority of road networks more attractive than public transport. Highway advocates as well as environmental groups often ignore this fact. Sometimes they realise, that roadway capacity expansion results in longer vehicle trips, which induce travel. But the implications of induced travel are underestimated.

Only in special cases can public transport be more attractive than slow vehicle traffic. In Paris and London the speeds of vehicle traffic and public transport are nearly equal. In this case a growing demand leads to a growing use of public transport. The self-limiting equilibrium of speed is maintained (the Mogridge Conjecture).

The concept of slow vehicle traffic can be evaluated by cost-benefit analysis. Ignoring induced travel in transportation planning tends to skew decisions toward highway improvement and away from more efficient alternatives. Therefore the evaluation methods developed for roadway improvements have to be changed considerably.

Slow vehicle traffic results in fewer person kilometres of travel and needs a lower road capacity than fast vehicle traffic. Higher speeds induce travel and lower speeds discourage travel. This induced travel is widely ignored by environmental groups, city planners and highway engineers.

The UBA (German Federal Environmental Agency) suggests scenarios, which include drastic speed reductions (UBA, 1999). Thus the concept of slow vehicle traffic is supported by the UBA. It is surprising, that speed reductions aren't suggested as an alternative to capacity expansion but in addition to capacity expansion. An economic evaluation of the suggested combination of speed reduction and roadway improvement is missing.

City planners assume that trip lengths and, with that, the person kilometres of travel depend on land use, not on speed (Maurer, 2000). It is acknowledged that land use policy can have an impact on the potential for short trips. However, no consideration is given to the impact of speed on whether or not the potential for short trips is accepted. The supporters of the town with short trips should support the concept of slow vehicle traffic.

Highway engineers generally ignore induced travel. In the existing German Federal Transport Plan induced travel was ignored totally (PLANCO, BVU, 1993). In the future it is intended to take into account 7.7% of the induced travel (Englmann *et al.*, 2001). It is assumed, that only 7.7% of the time savings are reinvested. The German EWS 97 (Recommendations for trunk road assessment) ignores the induced travel (FGSV, 1997). Since the evaluation methods for

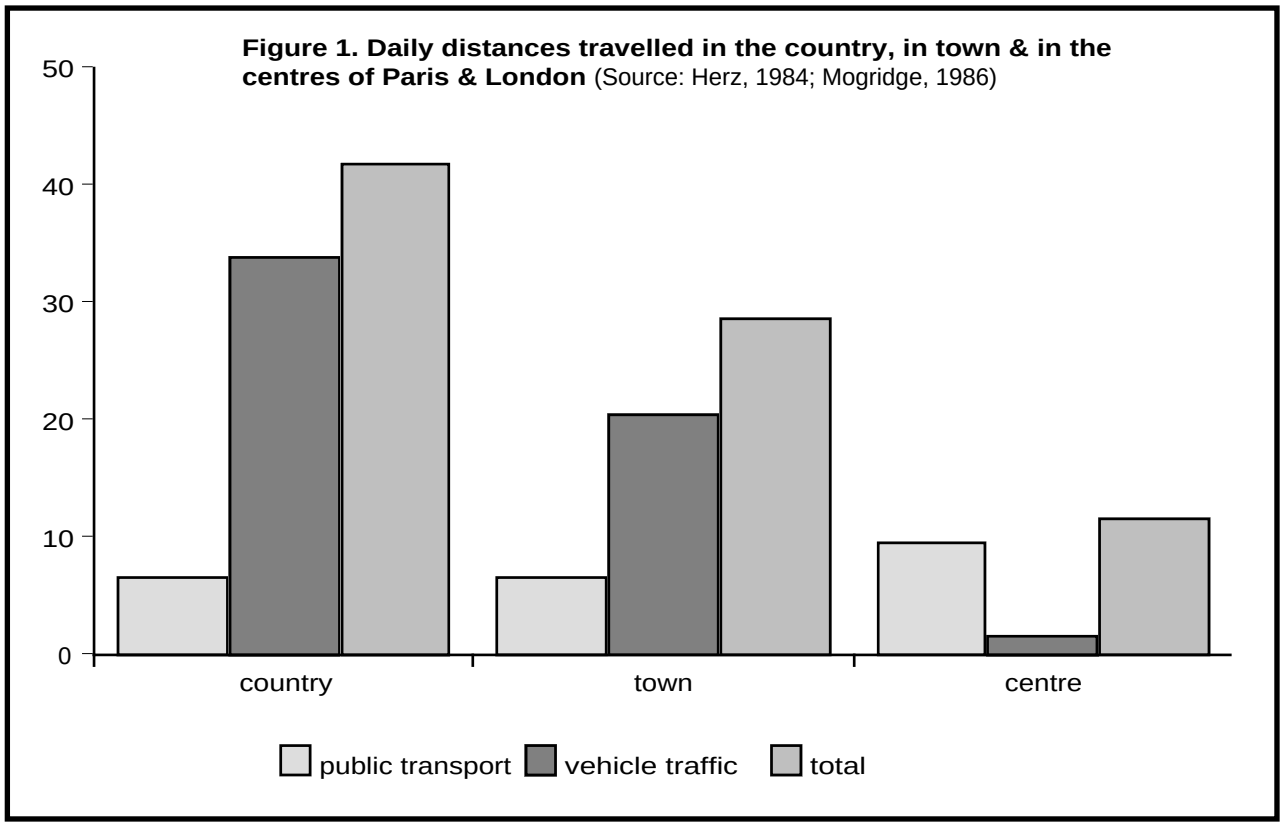


Figure 1. Daily distances travelled in the country, in town & in the centres of Paris & London (Source: Herz, 1984; Mogridge, 1986)

roadway improvements lead to high economic disbenefits for the concept of slow traffic, one can conclude that highway engineers are highway advocates and don't support the concept of slow vehicle traffic.

The influence of highway advocates goes beyond highway engineers. The UBA and city planners avoid conflicts with highway advocates. Environmental groups therefore have weak scientific support (Knoflacher, 1986; Pfleiderer & Braun, 1995; Becker & Richter, 2002)

This paper is organised as follows. First, the daily distances travelled in real networks with different speeds are compared. It is shown to what extent the person kilometres of travel can be reduced by speed reductions. This is followed by a discussion of the modelling frameworks that can be employed to incorporate induced travel. Finally it is pointed out, that induced travel fundamentally changes economic evaluation. Thus a sketch for an Environmental Transport Plan is given.

Daily Distances Travelled

The speeds and daily distances travelled in real traffic networks are important to assess the potential of traffic volume reduction. Figure 1 shows the daily distances travelled in the country and in town (Herz, 1984). It can be seen in Figure 1 that in town the daily distances travelled are considerably smaller than in the country. The essential reason for that is the lower speed of vehicle traffic. The daily distances travelled in public transport don't change. Slower vehicle traffic in towns remains more attractive than the public transport.

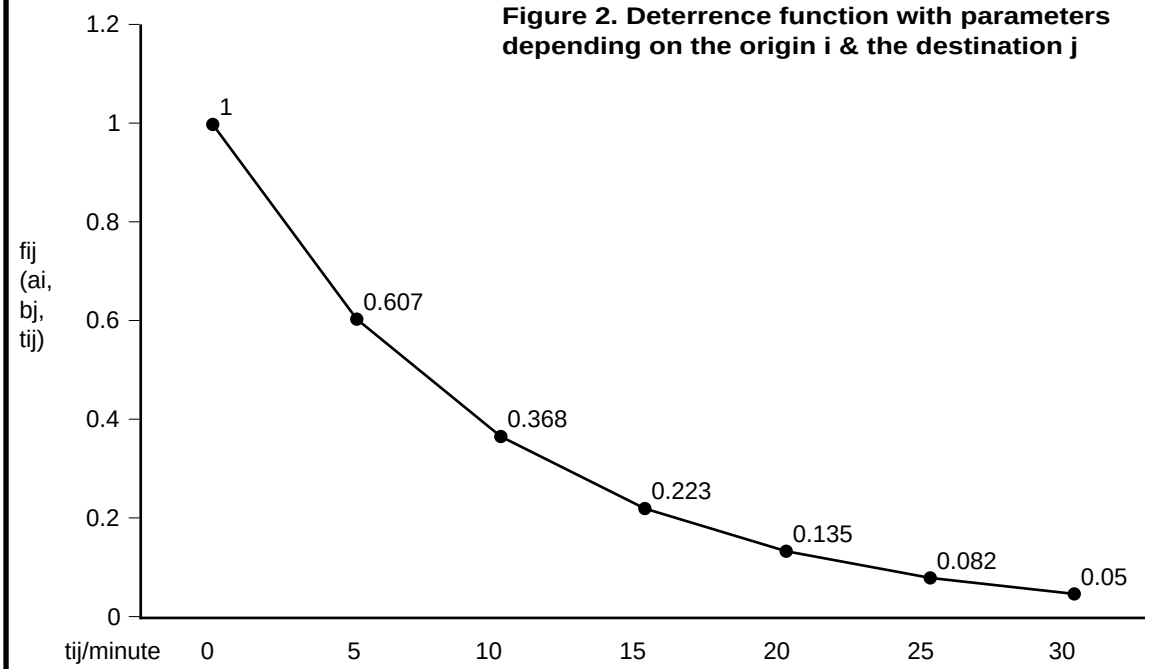
The daily distances travelled in the centres of Paris and London are also presented in Figure 1. It can be seen in Table 1, that journeys made by car entirely within the city centres achieve about 8 km / h door-to-door direct speeds. This is the same as that achieved by rail. An equilibrium between the two is achieved in which the flow on both adjusts so that the average direct speeds are equal (the Mogridge Conjecture). Increases in road capacity will then merely affect the modal split and will not affect direct speeds (Mogridge, 1986).

Table 1. Time budgets & speeds

	In the country	In town	In the centres of Paris & London (combined)
Time budget (minutes per day)	764	877	90
Speed of car traffic (kmh)	394	257	8 (direct)
Speed of public transit (kmh)	276	151	8 (direct)

Source: Herz, 1984; Mogridge, 1986

Figure 2. Deterrence function with parameters depending on the origin i & the destination j



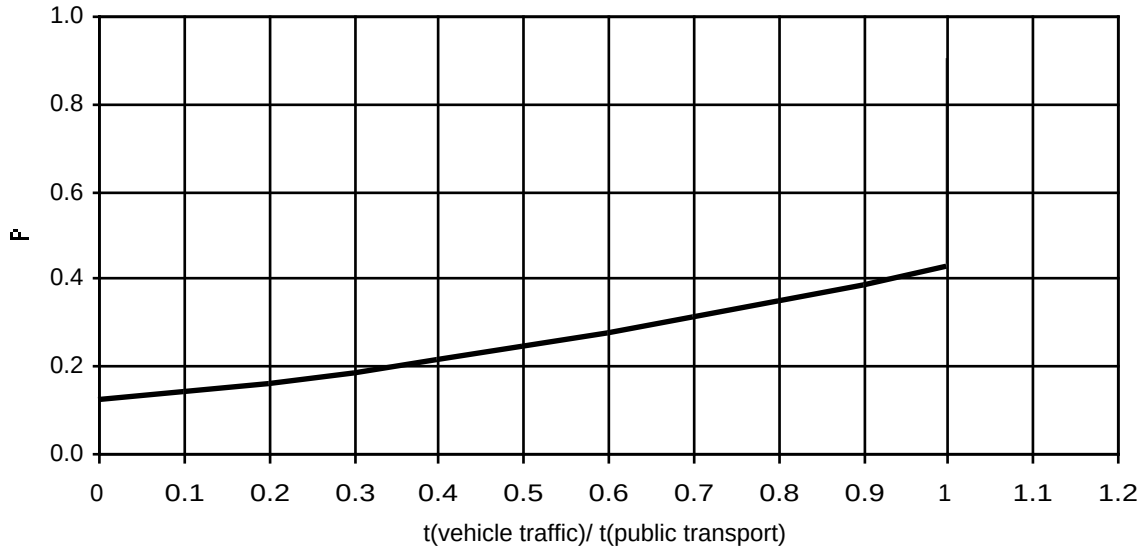
Speeds of vehicle traffic and daily distances travelled differ widely. So the concept of slow traffic can reduce person kilometres of travel considerably. Moreover slow vehicle traffic is more attractive than public transport as long as the slow vehicle traffic is faster than public transport.

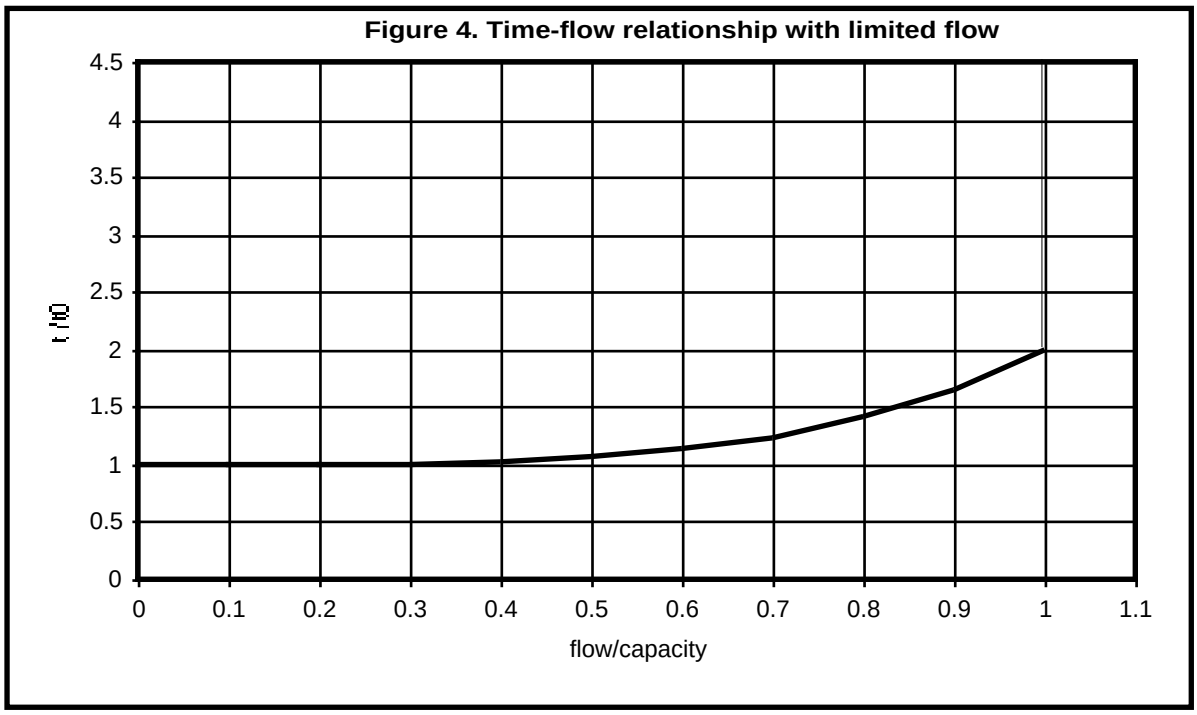
Travel Models

A travel model for the concept of slow vehicle traffic should predict the results shown in Figure 1 and Table 1. The model must incorporate the induced travel, the Mogridge Conjecture and capacity restraints of the road network.

Induced travel primarily changes trip lengths. Therefore, induced travel can be incorporated in trip distribution. Figure 2 shows a deterrence function, which depends not only on the journey time ***tij*** between origin ***i*** and destination *j* but also on constants ***ai*** of the origin and ***bj*** of the destination. With this deterrence function the travel time budgets of origins and destinations can be kept constant (Thust, 1999). For constant travel times there exists a unique solution and an algorithm to find the solution. Experience shows, that no problems arise, if the flow depends on the travel time on a link.

Figure 3. Probability P for the choice of public transport depending on the travel time ratio





It can be seen in Figure 1 and Table 1 that vehicle traffic will shift to public transport if the speed of vehicle traffic becomes equal to the speed of public transport. Incorporating induced travel and using a modal split function presented in Figure 3 can model the Mogridge Conjecture.

Figure 4 provides a representation of a time-flow relationship with a maximal flow. If flow becomes equal to capacity, then travel time is no longer determined by flow. It is necessary to take induced travel into account to calculate travel time. The traffic assignment problem can be solved by a multiplier penalty method (Thust, 1999).

The UBA incorporates a gravity model with an upper constraint for the time budget (UBA, 1999). If roadways are improved, this constraint doesn't have an effect. Thus induced travel is only roughly taken into account.

Public transit planners include a constant time budget in their model for public transport (Intraplan Consult, G. Heimerl, 2000). For vehicle traffic, constant travel times are assumed because it is not intended to influence vehicle traffic.

Highway engineers neglect induced travel totally (FGSV, 1997) or widely (Englmann *et al.*, 2001). The BVWP model assumes, that only 7.7% of traffic can change destination (Englmann *et al.*, 2001). Englmann, Haag and Pischner couldn't find any measurements neither in Germany nor worldwide to justify the assumed 7.7% (Englmann *et al.*, 2001). This is not surprising, because the 7.7% have to be replaced by 50% in the short run and 100% in the long run. If 92.3% of induced travel is ignored, the model doesn't have any significance. That highway engineers ignore the induced travel and don't engage with its critics (Knoflacher, 1986; Pfleiderer & Braun, 1995) is a good indication that induced travel is of great importance.

Economic Analysis of Transportation Projects

The evaluation methods for highway investments compare the benefits with the costs of investment. With such a defined benefit-cost ratio, different projects can be compared.

The BVWP method defines projects with a benefit-cost ratio that exceeds three as urgently needed. The financial requirements for all projects of urgent need are much higher than the public funds available. If the calculated benefit-cost ratios were right, then the concept of slow vehicle traffic would lead to disbenefits. Therefore, these calculations shall be checked.

Figure 5 shows the average contributions of the benefit components to the overall benefit of the BVWP method (BMV, 1994). In Figure 5 induced travel is ignored. Roadway improvements then lead to travel time savings that form a major part of the benefits. The travel time savings of freight traffic form the major part of the transportation cost reduction. The travel time savings of passenger transport are taken into account by the so-called accessibility improvement. Since with a constant time budget there are no real travel time savings (Knoflacher, 1986) it is obvious that the BVWP method has to be modified if induced travel is taken into account.

The benefit components can be divided into user benefits and external benefits (negative external costs). User benefits like transportation cost reduction and the accessibility improvement refer to the user. External benefits such as reduction of accidents, regional

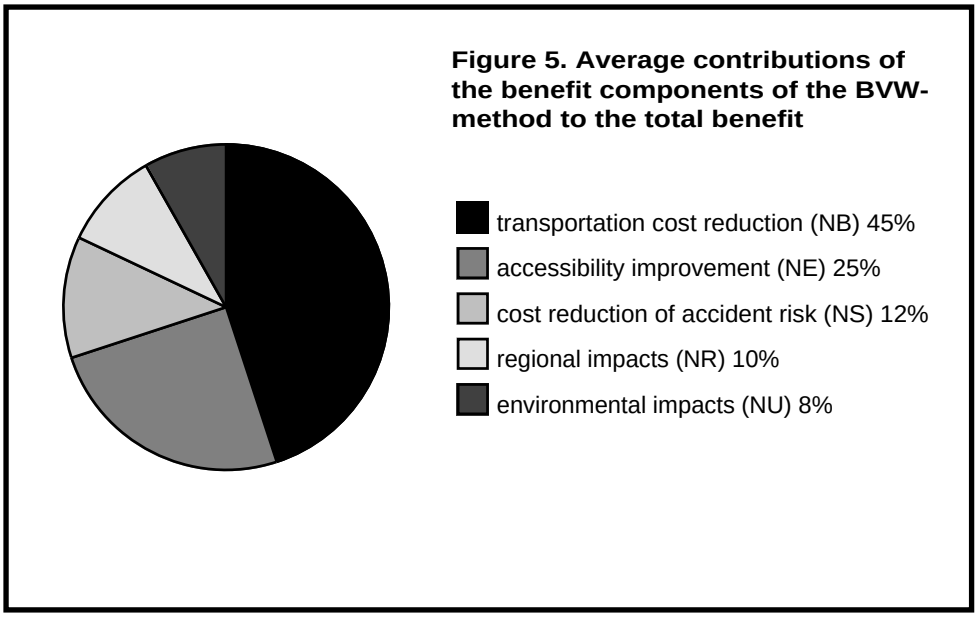


Figure 5. Average contributions of the benefit components of the BVW-method to the total benefit

impacts and environmental impacts refer to the general public.

User benefits

At first user benefits are looked at. The question is, how speed changes and cost changes have to be evaluated if induced travel is taken into account. To clarify the problem a very simple economic example is chosen.

It is assumed, that at the beginning 1 kg of apples costs €3. The apples then get cheaper. There are two scenarios looked at:

Scenario A (elastic demand):

All savings are reinvested to buy apples. The price goes down to €2 per kg and 1.5 kg apples are bought.

Scenario B (fixed demand):

No savings are reinvested to buy apples. Since the demand is lower than in scenario A the price is lower. The price goes down to €1 per kg and 1 kg apples is bought.

Now the question is how the price reduction of scenario A is evaluated. Since scenario A has to be evaluated, the price of €2 per kg is called real price and the price of €1 per kg is called the fictitious price. There are three evaluation methods:

Evaluation method 1:

The total expenses for scenario A are compared. There are no savings at all. However one gets more apples for the same money.

Evaluation method 2:

The expenditure is related to a constant amount of 1 kg and the real price of scenario A. In this case €1 is saved.

Evaluation method 3:

The fictitious price of scenario B is used to evaluate scenario A. For a constant amount of 1 kg €2 are saved.

In transport planning all three evaluation methods are discussed. The evaluation method 2 related to a fixed amount and the real price is very meaningful. This corresponds at least approximately to the consumer surplus theory and therefore has a scientific justification (Helms, 2001; Cerwenka, 1997). In transport planning a fixed amount can be defined by a fixed trip table. Real prices are real travel times and real vehicle operating costs.

The BVWP method neglects induced travel largely. Therefore, the evaluation is based essentially on fictitious travel times (Englmann *et al.*, 2001). Accordingly, the calculated values for transportation cost reduction and accessibility improvement are much too high.

It remains the question, how much transportation cost reduction and accessibility improvement change. Under congested conditions the predicted increase in speed can be reduced by a factor of three (DeCorla-Souza, & Cohen, 1998). Thus the transportation cost reduction and the accessibility improvement can be reduced by a factor of three if one takes induced travel fully into account.

External benefits

Induced travel also increases external costs of automobile use. It can be seen in Figure 5 that roadway improvements reduce accident risk. The reason for that is that freeways have a lower accident risk than arterials. This advantage is dramatically reduced if, instead of using constant distances travelled, constant travel times are taken into account. Thus, the benefit of the reduction of accident risk is changed significantly if induced travel is taken into account.

Regional impacts should be disregarded because they have neither a sound theoretical background nor a support by empirical findings.

Figure 5 shows that roadway improvements have

positive environmental impacts. This is a very surprising result. Measurements including induced travel show, that environmental impacts are negative (Becker & Richter, 2002). It follows that the benefit of environmental impact is negative, if induced travel is taken into account.

From the above assessments, one can conclude that induced travel can reduce the benefit-cost ratios roughly by a factor of three. It is therefore possible, that projects defined as urgently needed are not needed at all.

Disregarding induced travel is not the only possibility to reassess the evaluation methods. Some components of the BVWP method are not tested by consumers' willingness to pay. If willingness to pay is taken into account the calculated benefit-cost ratios decrease further.

One comes to the conclusion that the concept of the slow vehicle traffic can be justified by reanalysing cost-benefit calculations.

The UBA will not evaluate the proposed slow vehicle traffic scenario within its roadway improvement model (UBA, 1999). This is very regrettable since UBA is aware that highway advocates largely manipulate the BVWP method.

Conclusion

In the case of the Mogridge Conjecture an increase in road capacity only changes the modal split. The speeds of vehicle traffic and public transport are not changed. Therefore, most of the benefit components are zero or negative. Transportation cost reduction is negative because public transport has lower operating costs than vehicle travel. Accessibility improvement is zero because the speed doesn't change. The cost reduction of accident risk doesn't change very much because the accident risk of freeways and public transport are not very different. The regional impacts are zero. The environmental impacts are negative. In the case of the Mogridge Conjecture a capacity expansion cannot be justified. The concept of slow vehicle traffic is modified to the concept of equal speeds in vehicle traffic and public transport.

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Benchmarking & European Sustainable Transport Policies

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Abstract

Benchmarking is one of the management tools that have recently been introduced in the transport sector. It is rapidly being applied to a wide range of transport operations, services and policies.

This paper is a contribution to the discussion of the role of benchmarking in the future efforts to support *Sustainable European Transport Policies*. The key message is that transport benchmarking has not yet been developed to cope with the challenges of this task. Rather than backing down completely, the paper suggests some critical conditions for applying and adopting benchmarking for this purpose. One way forward is to ensure a higher level of *environmental integration* in transport policy benchmarking. To this effect the paper will discuss the possible role of the so-called Transport and Environment Reporting Mechanism developed by the European Environment Agency. The paper provides an independent contribution to the discussions within the EU-sponsored BEST Thematic Network (Benchmarking European Sustainable Transport) which ran from 2000 to 2003.

Keywords

Benchmarking, BEST, Environmental integration, Indicators, Sustainable Transport

Why bother?

Why is benchmarking of European sustainable transport policy needed at all, and why are efforts at EU level required? Some major reasons can be given:

- Current trends in European transport are not sustainable, as clearly recognised in the Common Transport Policy White Paper (CEC, 2001) and elsewhere; moreover accession countries are quickly adopting transport patterns similar to EU member states;
- Similar problems and challenges confront (more or less all) member states, regions and cities that want to influence current transport trends, while some seem more 'advanced' or 'successful' in addressing them than others do;
- There is therefore considerable interest among policy makers for international comparisons of transport trends and policy measures (ranging from sheer ranking exercises to a more genuine willingness to understand and adopt good practices);
- Comparative analysis and benchmarking already have demonstrated their ability to contribute to learning in several policy areas, including transport;
- Analytical efforts are needed to study the real scope for change in transport trends, i.e. to separate genuine policy effects from contextual factors and coincidence; and
- Analytical understanding needs to be integrated with political processes and institutional routines in order to increase capacity for 'knowledge utilisation' and learning at the policy level.

Since there is a clear demand for improving policy making and learning from others in terms of sustainable transport policy it is very relevant to consider benchmarking which has been developed as a systematic tool for such purposes. Benchmarking could clearly have a role in the advancement and promotion of sustainable transport policies. Some ideas of what that role could be will emerge through the following review of links between benchmarking, policy and sustainable transport.

Benchmarking as an instrument

This paper will not discuss benchmarking in general, but will rely on concepts and definitions as provided in the 'Benchmarking guide' produced by OGM Consultants in the BEST process (OGM, 2002). Here a number of broadly similar definitions of benchmarking are given:

> '…the continuous, systematic search for, and implementation of, best practices which lead to superior performance',
>
> … 'the process of identifying, understanding and adapting out-standing practices from organisations anywhere in the world to help your organisation improve its performance',
>
> … 'the means by which we attempt to locate a level of performance in a certain area that is superior to ours, then to change the way we do certain activities in order to improve our performance'.

Benchmarking can in general terms focus on either management practices (sometimes called process

The views expressed in this paper are those of the author.

benchmarking) or the results of those practices (performance benchmarking) and various combinations and extensions along those two dimensions (Fernandez *et al.*, 2001).

Benchmarking described in ideal terms is typically supposed to include several stages such as selecting the issues; identifying the entities to be compared; defining indicators; collecting data; analysing the particular practices and results in comparative terms; and integrating the results in management efforts to change own practices (OGM 2002; Fernandez *et al.*, 2001).

Moreover, benchmarking is often understood as an element in ongoing efforts of organisations to learn and improve, not as a one-off project. The learning component is especially emphasised, not only as in a closed circuit, but learning together 'with and from' others, including benchmarking partners.

There is an extensive literature on benchmarking which sets out several other dimensions, but the above general understanding will suffice as a basis for the following discussion.

What is it to benchmark policies?

The issue here is to what extent benchmarking as described above can be used in a *policy context* to support and perhaps improve policy making, in the same way that it has helped to improve management and performance in the private business context where the method originates. There are some important aspects to take into account when moving from the management area to the (public) policy area. Three such aspects are briefly discussed.

Firstly, policy making is often more complex than management. Policy makers typically cannot produce changes and results in the same direct ways as organisational managers can, simply because public policies are set in a democratic society that does not work like a managerial hierarchy. Polices are therefore not likely to provide direct control of the behaviour of citizens or businesses or even over processes in which they interact.

Any policy will usually involve several different goals and objectives, and a wide range of stakeholders may have legitimate but different interests in the way it is conceived and implemented. This means, for instance, that what is the 'best practice' to compare with is highly dependent on the context and may well be disputed[1]. It is therefore crucial to consider the context carefully, and also to take into account which stakeholders are involved in the design, conduct and interpretation of a benchmarking exercise. Some kind of interpretation of benchmarking performance results, *in terms of the wider policy aims*, in the area of application will be called for (Wyatt, 2002)[2].

Secondly, it is relevant to distinguish between benchmarking *for* policy making versus benchmarking *of* policy.

- Benchmarking *for* policy making means that benchmarking is used as a way to generate information for policy makers about policy options and likely policy outcomes;
- Benchmarking *of* policy means that the benchmarking effort is having a particular policy itself as its object. Such a benchmarking exercise can obviously also be used to inform policy makers (as benchmarking *for* policy), but the task is more complex.

The first instance – benchmarking *for* policy – can involve a very broad range of benchmarking studies since the list of what is relevant to 'inform' polices in principle is endless. However it is important that the study is made in a way that provides useful, *policy relevant* information, not just any information. The indictors should convey policy concerns and not just company or management concerns. In the worst case an uncritical use of management benchmarks could give a distorted feedback to policy, for instance if performance is measured only in terms of company cost factors, not spill over or external costs; or if the focus is on service performance only, and not on e.g. safety. This calls for a careful process to deduce the policy relevant information from 'management' or 'business' level indicators and benchmarks, *if* the exercise is to provide balanced information for policies.

The second instance – benchmarking *of* policy – can also involve a broad range of studies since it is possible to define 'a policy' in different ways. A policy can for instance be conceived as a *document* stating some intentions; it can also be seen as a set of *instruments;* or it can be a set of particular *actions* with certain results. Often the latter will be the most meaningful approach for benchmarking. Policies can also be defined at different levels – from a detailed policy of e.g. promoting 'green procurement' of transport equipment in a government department to a broad policy of promoting 'sustainable transport' in

[1] As May put it: 'Is it reasonable to expect cities which give a different emphasis to, for example, economic development, to expect to achieve the same performance in terms of, say, environmental quality? Even where cities have the same balance of objectives, there will be contextual aspects which influence their ability to achieve the same standard.' (May, 2002, p. 4).

[2] See again May, who is '… doubtful as to whether it is sensible to set targets for any one objective without checking that they are consistent with a strategy designed to meet several objectives.' (May 2002, p 4). This is also reflected in a recent OECD benchmarking project: 'Government policy makers (along with transport industry and logistics service providers) have an interest in the efficiency (including time, cost and reliability), safety and sustainability of transport systems, although at a more aggregate level than the private sector.' (OECD, 2002, p. 7).

Europe[3]. It is clear that the broader the policy under study is then the greater the challenges of a benchmarking exercise. The obvious answer would be to focus only on narrow well-defined policies when undertaking a policy benchmarking exercise[4]. However, such a limitation may in the end leave out much of what is actually relevant for producing policy results, and will not necessarily suffice to provide information for a transport policy. This calls for supplementary efforts. In other words benchmarking *of* policy may be a quite challenging task.

The *third and final* point raised here is that *comparability* may be more difficult in terms of policies than in terms of management (Deiss, 2000). The main reason to do benchmarking either of or for policies will typically be to improve policy outcomes and results. However, in order to understand the outcomes and the potential transferability it will often be necessary to do an in depth evaluation of results, explanatory factors and context. To compare results and outcomes across constituencies and to identify 'best practices' without a prior policy evaluation may lead to unrealistic expectations or failed policies (a negative outcome of 'policy tourism', as it has been put).

This discussion can be summed up in the following minimum suggestions for what (transport) policy benchmarking in general would need to consider:

1. A policy relevant benchmarking exercise (be it *for* or *of* policy) addresses a particular *policy problem, area, goal, instrument or process.* To provide focus, benchmarking efforts will typically narrow in on some *combination* of those elements; problem, area, goal, instrument and / or process (like 'taxation instruments to reduce congestion in large urban areas'). A challenge for promoting the mutual learning effects of benchmarking will be to define a combination of elements that is both clear enough to be operational and relevant beyond one case and context to attract interest from more than one organisation.
2. Since policy benchmarking without any concern for actual results (outcomes) would hardly qualify as relevant benchmarking neither *for n*or *of* policy making, it will be very helpful to build on existing thorough policy evaluations (or include them as part of the exercise) in order to identify data and explanations that can support the assessment of policy results.
3. The indicators should be chosen and the 'best practice' results identified in terms of their relevance for *the wider context* in which the policy is (to be) applied, including wider policy goals, stakeholders, and relevant background factors. At the very least it must be avoided that the messages provided by chosen indicators distort general policy aims, or that 'best practice' is identified or achieved through ignoring (other) relevant major policy concerns.

The following discussion will narrow in on benchmarking *for* policy in a particular context.

What is it to benchmark for a sustainable transport policy?

The policy context addressed here (as in BEST) is European *sustainable* transport policy. This raises the need for defining what 'sustainable transport' and 'European sustainable transport policies' are[5].

Obviously, 'sustainable transport' can have several different meanings, even if the starting point would be taken from a shared overall definition of sustainable development such as the one provided by the Brundtland report: 'Development that meets the needs of the present without compromising the ability of future generations to meet their own needs' (World Commission on Environment & Development, 1987; 43).

The problem is to specify the implications of the general concept at the sectoral level. One complicating factor is that transport is not necessarily a 'need' in itself, but rather a means to an end, which could be loosely defined as *access* (OECD, 1997). The transport 'needs' of future as well as present generations are therefore not trivial to specify. Another complicating factor is that transport systems and services are intrinsically *embedded* in wider socio-economic structures that contribute together to the overall pressures on the environment. This makes it difficult to establish a clear-cut notion of sustainability at an (isolated) sector level (Nijkamp, 1994). Finally sustainability may refer to various *dimensions* of development (social, economic, environmental) that all may have to be taken into account).

For these and other reasons there has been limited progress in establishing a theoretically agreed definition of sustainable transport (Gudmundsson &

[3] To support this OGM's draft 'Benchmarking Guide' rightly states that merely comparing policy instruments is not very relevant as a benchmarking exercise. The guide also mentions the NATCYP project that has focussed on benchmarking of cycling policy *documents*, with the inherent limitations of such an approach. (OGM, 2002).

[4] As according also to the OECD study: 'Benchmarking exercises are often most effective when comparing similar activities' (OECD 2002, p 10).

[5] See also the Recommendations from BEST Conference 2: 'There is need for consensus on a clear definition of 'European sustainable transport' in order to give clarity and focus to the work of BEST, and to ensure that those responsible for transport policy-making in Europe are working towards a common goal. … The European Commission should continue to promote actively, through BEST and other initiatives (research and policy), efforts to build a European consensus on the meaning and objectives of sustainable transport.' (OGM, 2001).

Höjer 1996; and ongoing discussions at http://www.stellaorg.org). A theoretical approach to define sustainable transport will not be elaborated further in this paper, but more research efforts in this direction are clearly needed.

Instead a more pragmatic approach will be explored in which pursuing a 'sustainable transport policy' would mean achieving the objectives of a policy that has sustainability as an overall objective. This is (to some extent) the case for the European Common Transport Policy (Bärlund, 2000). We will therefore look a little into the way sustainability is addressed in the EU Transport White Paper (CEC, 2001).

The Transport White Paper includes a very wide range of policy aims and proposed measures. There are four overall aims:

- shifting the balance between modes;
- clearing bottlenecks;
- placing users at the heart of transport policy; and
- managing the effects of transport globalisation.

Promoting a sustainable transport system is a cross cutting aim, but it is not clear how it relates to the four overall aims or how the proposed concrete measures in the White Paper are supposed to contribute to achieving this cross cutting aim. Moreover, there are few clear targets that can serve as a reference for sustainability.

To get some guidance we can look at the most significant quotes in the White Paper concerning sustainability (all emphasis added by the author):

a) 'The transport system needs to be optimised to meet the demands of enlargement and sustainable development, as set out in the conclusions of the Gothenburg European Council. *A modern transport system must be sustainable from an economic and social as well as an environmental viewpoint*.' (p. 6);

b) 'Together with enlargement, a new imperative – sustainable development – offers an opportunity, not to say lever, for adapting the common transport policy. This objective, as introduced by the Treaty of Amsterdam, *has to be achieved by integrating environmental considerations into Community policies*.' (p. 9–10);

c) 'Numerous measures and policy instruments are needed to set the process in motion that will lead to a sustainable transport system. It will take time to achieve this ultimate objective, and the measures set out in this document amount *only to a first stage, mapping out a more long-term strategy*.' (p. 18);

d) 'This sustainable transport system *needs to be defined in operational terms* in order to give the policy-makers useful information to go on. Where possible, the objectives put forward need to be quantified … A monitoring tool has already been put in place by way of the *TERM mechanism* (Transport and Environment Reporting Mechanism).' (p. 18).

Four points emerge from the quotes:

- Sustainable transport is recognised as a goal combining economic, social and environmental dimensions;
- Integrating the environmental dimension with other dimensions of policy stands out as the basic requirement of a sustainability policy as has also been recognised in the EC Treaty itself[6, 7];
- The goals and policies of the Common Transport Policy White Paper are intended to support – but will not suffice in themselves to achieve – a sustainable transport system in Europe; and
- The White Paper does not spell out directly how progress towards sustainable transport is to be assessed, but it refers to the Transport and Environment Reporting Mechanism as an important instrument.

From this we can deduce at least one basic, minimal requirement in relation to benchmarking for European sustainable transport policy, namely that such an exercise must help to incorporate environmental concerns on the same level as other concerns.

In terms of practical benchmarking studies this could be translated as a requirement that the performance indicators used to describe and compare practices must include environmental indicators on a par with economic and social indicators of service performance. This is to help understand and document if and how the practices under study contribute to integrating long term environmental concerns with economic and social aspects of transport policy. Conversely, if environmental performance is not dealt with at the same level of management, dedication and professionalism as other indicators, it will not be possible to establish any benefit in terms of progress towards integration and sustainable transport.

[6] 'Environmental protection requirements must be integrated into the definition and implementation of the Community policies and activities referred to in Article 3, in particular with a view to promoting sustainable development.' (Article 6, Consolidated Treaty of the European Communities).

[7] Integration of environmental concerns has been defined by the European Commissions Joint Expert Group of Transport and the Environment: 'Integration of environmental concerns into a sector activity means that the actors in that sector take environmental issues into account on an equal basis with other concerns, such as economic and social aspects… Successful integration requires that environmental objectives are formulated and included in the process at the same time and level of commitment as economic and social objectives.' (http://europa.eu.int/comm/environment/gpc/) See also Expert Group on Transport and the Environment (1999).

Table 1. Selected European transport benchmarking related projects

Project	Number of Performance indicators	Of which environmental
ISOTOPE	9	-1
EQUIP	111	-2
Quattro	11	0
CoMET /NOVA	32	0
BEST (project)	36	1
Citizens Network	39	-2

Notes:
Values in (brackets) refer to a case where environmental indicators reportedly have been considered but not included in actual measurements
Explanations:
ISOTOPE = Improved Structure and Organisation for Transport Operations of Passengers in Europe (EU funded)
QUATTRO = Quality Approach in Tendering urban public TRansport Operations (EU funded Research project)
EQUIP = Benchmarking quality in urban passenger transport (EU funded Research project)
CoMET/NOVA = Private 'Benchmarking clubs' for Metro companies in 16 cities worldwide
Citizens Network Benchmarking Initiative. EU sponsored project at urban level (40 cities)
BEST (project) = Benchmarking European Service of public Transport. Nordic/European ongoing project comparing public attitudes to public transport service in 9 cities
Sources: www.bestransport.org – www.eltis.org – www.europrojects.ie/equip

A cursory glance over some of the transport benchmarking and related studies that have been presented at the BEST conferences in the period 2000-3 shows, that there is not yet a strong tradition for taking environmental concerns on board in this detailed fashion at the performance indicators level (Table 1). Only very few projects consider the use of environmental performance indicators as measures of transport quality or service, and even fewer in practice apply any such type of indicators[8]. To the extent that reasons are given for this 'environmental deficit' they often refer to a lack of good methods and comparable data to incorporate the environmental effects. At the practical level, there seems to be is a need for stronger awareness of environmental issues as well as better tools to handle them in a benchmarking context.

On a broader level the need for monitoring progress towards European sustainable transport policy was noted in the White Paper, especially with a reference to the Transport and Environment Reporting Mechanism.

In the next section we will therefore discuss how this mechanism may be seen as a building block for future benchmarking efforts.

[8] Obviously the examples represent only a small selection of benchmarking projects in the transport sector as presented at BEST (e.g. omitting projects concerning freight transport, see OECD 2002.) Moreover some studies incorporating some environmental effects of transport practices and policies have recently come forward, e.g. CFIT (2001). However, the author would hold that the general picture would not change much if more studies were included.

The TERM

The Transport end Environment Reporting Mechanism (TERM) was set up in 1999 by the European Environment Agency (EEA) in collaboration with the European Commission and EUROSTAT (EEA 2001). The background of TERM is the European Council Summit in Cardiff in 1998, where the Commission and the Transport Ministers were requested to develop *integrated transport and environment strategies*. TERM was set up at the instrument to monitor this process.

A key output of TERM is *an annual indicator report* through which the effectiveness of transport and environment integration strategies is monitored. An extensive statistical compendium of data backs the approximately 40 indicators on transport and environment covering all member states (and accession countries from 2002; see http://www.eea.eu.int).

Importantly, the indicators used in TERM are derived from *key policy questions* regarded by EU policy makers as central to understanding whether current policy measures and instruments influence transport/environment interactions in a sustainable direction (Dom, 2000). This means that TERM can provide a useful overall point of reference for transport policy benchmarking efforts, both as a guide to define areas where benchmarking may be useful and as a background to interpret particular benchmarking studies in terms of their relevance for sustainable transport.

The seven policy questions of TERM are shown in Table 2. For each policy question there are a range of

Table 2. The seven policy questions of TERM (EEA 2001)

1. Is the environmental performance of the transport sector improving?
2. Are we getting better at managing transport demand and at improving the modal split?
3. Are spatial and transport planning becoming better co-ordinated so as to match transport demand to the needs of access?
4. Are we improving the use of transport infrastructure capacity and moving towards a better balanced intermodal transport system?
5. Are we moving towards a fairer and more efficient pricing system, which ensures that external costs are minimised and recovered?
6. How rapidly are improved technologies being implemented and how efficiently are vehicles being used?
7. How effectively are environmental management and monitoring tools being used to support policy and decision making?

5–10 indicators or so to describe how trends are developing.

Even though TERM has not been designed specifically for benchmarking, it has several features that can make it a relevant point of reference for sustainable transport benchmarking:

- As already mentioned TERM systematically reports a large number of indicators (c. 40) that are relevant for European sustainable transport policies; several of the indicators are directly related to objectives of the Common Transport Policy;
- Member states are 'compared' annually in terms of several areas of transport system and policy performance;
- The report is – to a large extent – based on official European statistics in the transport and environment areas, supplemented by extensive collection of qualitative information. It covers all member states, plus EFTA plus (now) the Accession countries;
- The TERM process is embedded in an institutional network encompassing key data providers and policy institutions throughout Europe.

As part of the ongoing development of TERM member states have been invited by the EEA to undertake benchmarking projects to address variations and similarities in transport data, systems or policies. Member states are also invited (in the EU transport integration strategy) to set up similar monitoring instruments at national level, and several countries have done so or are on their way to doing it (EEA, 2001)[9].

The potential utility of TERM in benchmarking

In what way can TERM be used to help link benchmarking studies to broader policy aims? In at least two ways:

Firstly, the policy questions (and the 40 indicators) could all be subject to benchmarking in order to stage a wide ranging effort to improve sustainable transport policy making in Europe. For most of the questions and indicators there is a need to develop further knowledge, methodology and not least to promote mutual learning processes.

Secondly, the list of policy questions and indicators could be used as a *checklist* to assess already ongoing or completed benchmarking studies and pilot studies. Examples of possible questions to be asked would be: Which of the seven TERM policy question(s) does this particular study contribute to answering? How do the particular indicators used in the study correspond with or differ from the ones used in TERM? Does the benchmarking study confirm or challenge the information provided by TERM, e.g. in terms of the ranking of countries? Does the study suggest good practice that could be used to inform future policy evaluation in addition to or together with TERM?

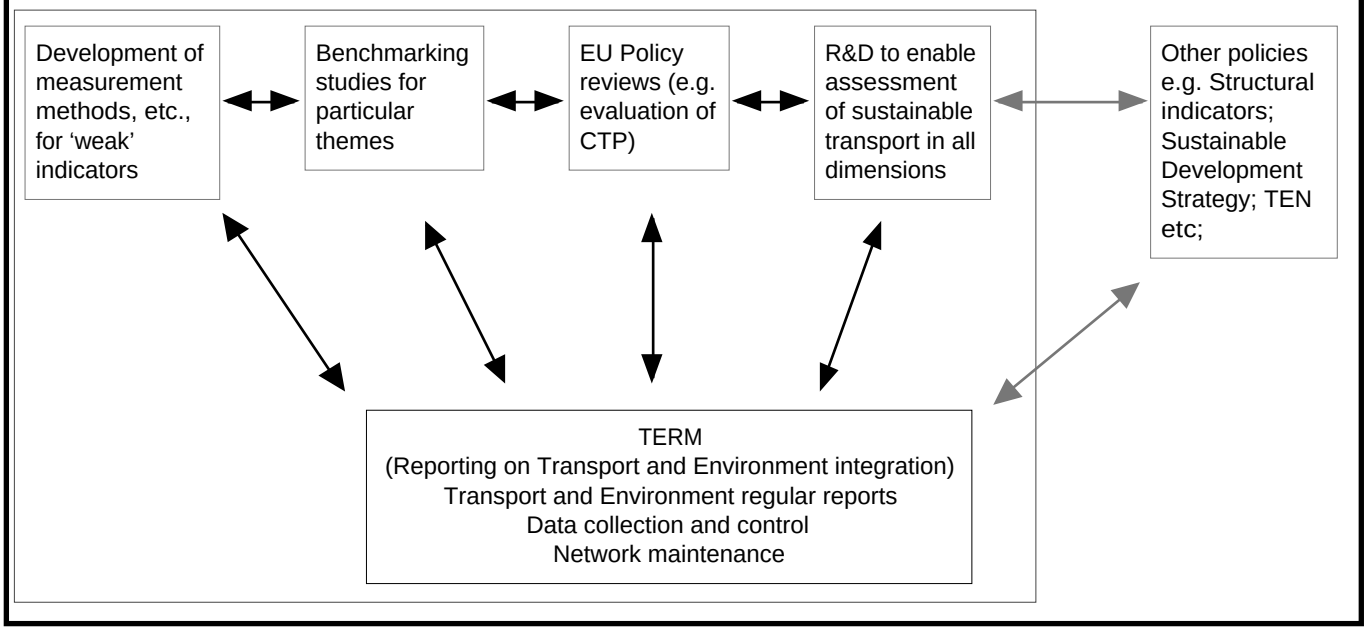
The future development of a broader monitoring framework

As already indicated TERM is at this point not directly a policy benchmarking instrument either *of* or *for* sustainable transport policies. It has some weaknesses in this respect:

- Many of the TERM indicators are still not backed by actual, reliable data for all member states; there are genuine gaps in data as well as some data of lower quality;
- The reporting of indicators does not in itself provide for deeper analysis of policy differences or policy success / failure; the 'comparisons' are mostly descriptive and not analytical;
- TERM focuses on the environment and does not monitor sustainable transport in its full set of dimensions (including social and economic dimensions);

[9] One outcome of this effort is the project on CO_2 polices, which has been led by the Dutch Ministry of Transport and presented at BEST.

Figure 1. A hypothetical process to develop a broader framework of sustainable transport monitoring



- The involvement of member states in the production and development of TERM is limited; therefore learning opportunities and effects have also been limited up to this point; and
- There is limited feedback to relevant policy decision situations; actual usage of TERM to make improvements in policies has not been documented.

A process to develop and supplement TERM with the help of benchmarking – and assisted by the 6th Framework Research Program – could therefore be envisioned. In this process towards a more comprehensive sustainable transport monitoring framework the following elements could be included:

- Development of better measurement methods, etc., for currently 'weak' TERM indicators;
- Benchmarking studies for particularly important policy issues;
- Broader policy reviews and evaluations (e.g. evaluation of the Common Transport Policy in 2005); and
- Conceptual development towards a comprehensive framework for monitoring sustainable transport in all its dimensions and aspects (including economic, social and institutional dimensions).

Such an approach is illustrated conceptually in Figure 1.

Summary & recommendations

The following conclusions and recommendations emerge from the above discussion…

Benchmarking for policy should in general be required to reflect on its relevance, in terms of broader policy concerns and context, including the intended relevance as well as possibly 'perverse' or unintended effects of the chosen indicators and practices identified. A distinction between benchmarking for and of policy may be applied.

Benchmarking *for* sustainable transport policy is highly relevant and feasible, but may require more thought, work and care than 'ordinary' business level benchmarking of transport operations. It will also require more work to identify clear objectives, targets and indicators of sustainable transport. Benchmarking *of* sustainable transport policy still seems quite far away.

Every benchmarking effort in the transport sector does not necessarily (or evidently) support a sustainable transport policy; this will have to be justified in each case in terms of the choice of topic, the use of performance indicators, and the way results are interpreted.

As a minimum, benchmarking studies aiming to support sustainable transport policy must reflect on how integration of environmental issues are directly supported (or not) through the analysis (choice of performance indicators, etc.) and in the practice identified as 'good' or 'best'. Serious efforts to monitor performance in environmental terms should be integrated with 'standard' performance measurements.

TERM cannot at this point be used as an instrument to do benchmarking *of* European transport policies. However it could support benchmarking *for* sustainable transport by serving as a general frame of reference for transport policy benchmarking studies. The seven policy questions of the TERM could be used as a general point of reference for selecting issues and the specific

indicators in TERM as more detailed references / points of departure for particular studies.

The following recommendations for future efforts should be considered by the EU Commission, Governments and other policy makers:

- It is important to make sure that the environmental dimension is integrated and made explicit (and not excluded or just assumed) in future EU sponsored benchmarking efforts and projects, if they are to help sustainable transport in a meaningful (and non-perverse) way;
- The TERM mechanism should be maintained and improved in terms of data quality, member state involvement, and its use in policy development and review; and
- There is a need to develop a broader framework (e.g. a Sustainable Transport Monitoring Framework) to monitor, assess and compare the sustainability of transport policies among member states, in which TERM and benchmarking are elements.

Finally the 6th Framework Research Programme could contribute substantially to this by initiating several types of research and experimentation to:

- Improve environmental assessment methods for transport systems and policy options;
- Operationalise other dimensions of sustainable transport (social, economic, etc.);
- Define relevant targets to be used as sustainability benchmarks;
- Explore the consequences of expanding the range of stakeholders involved in transport benchmarking projects; and
- Help develop a more general framework of Sustainable Transport Monitoring.

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Time to Change the Old Paradigm: Promoting Sustainable Urban Transport in Lahore, Pakistan

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Abstract

Urban transport is one of the most important sectors having a direct bearing on sustainable development because of the high growth of the transport sector's energy consumption and greenhouse gas emissions. This becomes more important in the case of Pakistan where the motor vehicle fleet is growing at two to three times the rate of population. Especially in Lahore, designed transport strategies and programs have resulted in high growth of urban road traffic, increasing air and noise pollution, and traffic crashes. The purpose of this paper is to review the adequacy and deficiency of transport planning in Lahore and to recommend some measures for developing a sustainable urban transport system in the city.

Keywords

Guiding Principles and Indicators, Lahore, Pakistan, Proposed Strategy, Sustainable Urban Transport

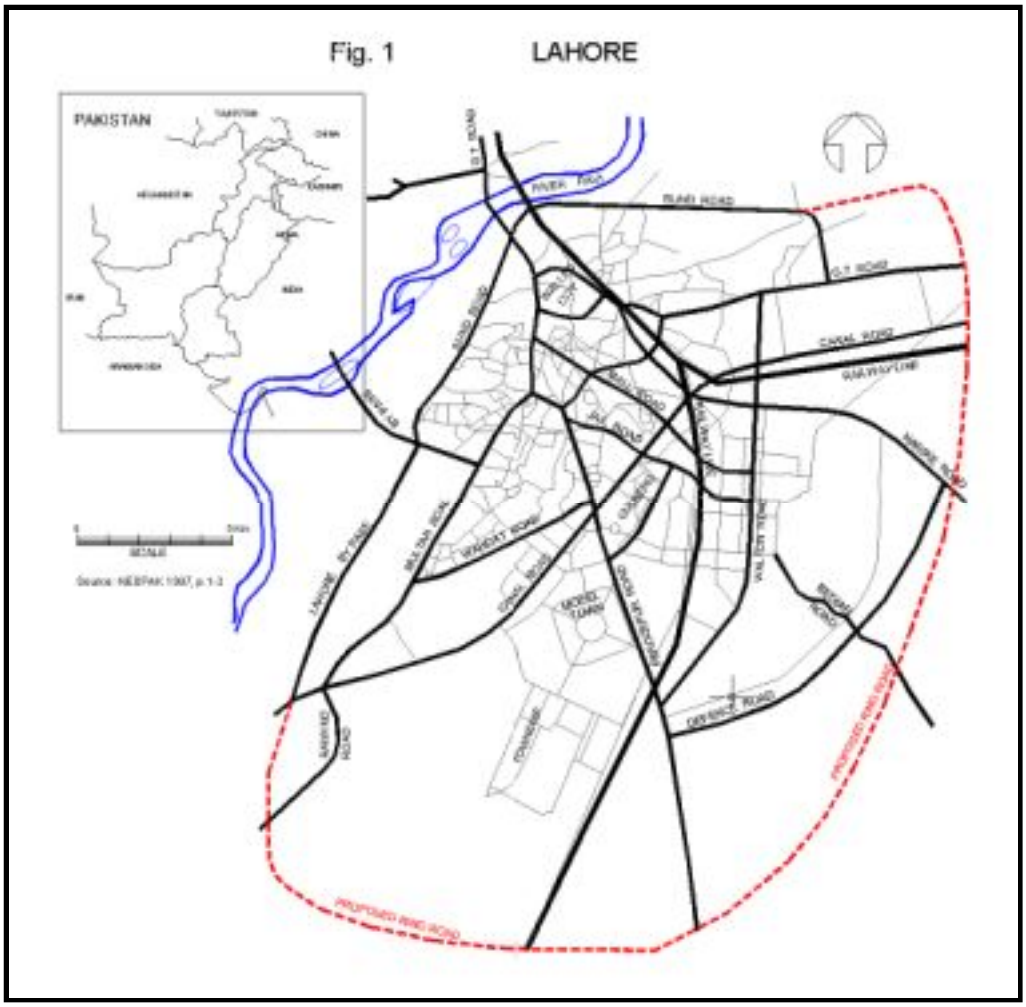
Introduction

Urban transport is one of the most important sectors having a direct bearing on sustainable development because of the high growth of the transport sector's energy consumption and greenhouse gas emissions at the global scale. By 2025, the transport sector's energy consumption and greenhouse gas emissions will have doubled and more people will become dependent on private automobiles (Whitelegg, 1993). The health and environmental implications of rapidly growing and poorly regulated motorisation are highly problematic at the local scale as well. It has a permanent and often irreversible impact on the environment through land take and intrusion. So it requires rationalisation and management of demand by shifting towards environment-friendly modes, collective transport and better utilisation of existing capacity. Without proper planning of future transport systems we can't achieve the principles of sustainability. Developing a sustainable transport system has been espoused as a potential solution to transport development. The idea of sustainable transport emerges from the concept of sustainable development having three basic components: environment, society and economy. It helps to reduce environmental impacts of transport infrastructure; contributes to economic prosperity by maximising transport efficiency and enhances social well-being by providing greater mobility for people. This concept also provides a framework to reappraise social and governmental priorities and conceive a new vision in the transport sector.

Adopting principles of sustainable transport becomes more important in the case of Pakistan where the motor vehicle fleet is growing at two to three times the rate of population growth, and motor vehicle usage is growing even faster (NESPAK, 1997). The negative externalities of transport are likely to aggravate as the use of motor vehicles continues to grow at an alarming rate. Vehicular traffic threatens pedestrian safety especially in busy urban areas. Congestion lengthens travelling time, increases operating costs and tends to lead to a higher level of emissions as well. Especially in the city of Lahore, designed transport strategies and programs have resulted in high growth of urban road traffic, increasing air and noise pollution, and traffic crashes. That's why Lahore needs to develop a sustainable transport system not only to reduce the externalities of transport but also due to achieving sustainable development for the 21st century. In order to help achieve this goal, the purpose of this paper is to review the adequacy and deficiency of transport planning in Lahore and to investigate a strategy for developing a sustainable urban transport system in the city.

Methodological approach

The research is based on a case study of Lahore. Lahore, being the second largest city in pakistan represents a true picture of Pakistani cities. Although each major city of Pakistan has a particular character, Lahore offers more opportunities to implement new policies because it is the social, cultural and political hub of the country. Sustainable transport guiding principles and indicators are established for Lahore as



a methodological approach for the analysis of existing data. These indicators of sustainable transport will assist in assessing and evaluating the sustainability of current and future transport development.

The Current Situation of Lahore

Lahore is located on the left bank of the River Ravi near the Indian border (Figure 1). The land use of the city can be divided into central, intermediate and outer zones. The central area has generally poor and middle class residential uses and a concentration of commercial and business land uses. The intermediate area (largely planned) is an uncontrolled mixture of housing (middle and upper income groups) and related activities and services (education, health, recreation, utilities, etc.) while there is considerable dependence on the central zone for job opportunities. The outer area presents typical characteristics of urban sprawl where the city has grown through low density housing for the rich (NESPAK, 1997).

In 1998, 5.5 million people resided in the city, 80% within 7 km of the city centre. The greatest concentration of population is within and around the central area and there is a gradual diffusion in the outer areas to an overall average density of 120 people per acre (NESPAK, 1997).

By revealing the existing urban transport situation of Lahore, the overall picture shows that 60% of trips are non-motorised. While some 51% of all trips are made on foot, there is no serious effort to plan for the pedestrian in Lahore. Provision of narrow footpaths along major roads is considered sufficient pedestrian planning. Among motorised transport the share of road based public transport is just 14%. The overall situation of public transport is very poor and does not provide a service for all members of society including women, the disabled and a variety of disadvantaged groups. One of the major issues is the 6.3% annual growth rate of vehicles in which 84% consist of motorcycles and cars (NESPAK, 1997).

Regarding air pollution, suspended particulate matter (dust and smoke), carbon monoxide (CO) and nitrogen dioxide (NO_2) are the most prominent and already exceed the WHO standard. The noise level of vehicles is more than 85 dBA standard. All transport vehicles in Lahore used non-renewable energy resources as well. Another aspect of these vehicles is the death rate which grew by 11.4% between 1990 and 1996, most of the victims being pedestrians and cyclists. Moreover, in Lahore, at least seven government organisations each with their own agenda are directly or indirectly responsible for transport and related environmental issues (NESPAK, 1997).

Table 1. Evaluations of Proposed Transport Policies

Sustainable Transport Principles	CITP, 1998	Planning Commission, 2000	NTRC, 2001
Economic Principles			
Economic Viability	+	++	++
No road building policies			
Road Pricing			
Social Principles			
Accessibility for all	++		++
Social Equity			+++
Education and public participation			++
Environmental Principles			
Pollution reduction measures	+	++	+++
Mitigating noise	+		+
Health and Safety	++	++	++
Renewable energy consumption			
Clean fuel technological advancement (R & D)		++	+++
Investment to environmental protection			+
Land and resource use	+		
Town Planning Principles			
Mixed Land use / compact cities			
High density			
Integrated planning			
Public transport encouragement	+++++	+++	+
Car reduction strategy	+		
Promotion of non-motorised traffic			
Pedestrian environment policy			
Realistic Institutional changes	++		++

* Shows the intensity of emphasis of proposal ranges from + to +++++ Source: (Imran, 2002, p. 121)

SUSTRAN (2000) has made an effort to guide sustainable transport activities by providing good and bad examples of transport in Asian cities. Considering the above figures, the best way to perceive the current city image is:

> 'A city, where roads and haphazard vehicles seem to be everywhere, a city where shops, schools and parks are far apart and require a vehicle to reach them, where roads act as barriers between communities, where traffic dominates the streets making them difficult to cross, where walking and cycling are unsafe and unpleasant, where public transport is infrequent and hard to get, where air pollution is a visible, pungent health hazard and where honking and road rage are the main forms of social exchange.' (SUSTRAN, 2000).

In spite of these results of existing policies the government is continuing to invest significant amounts in road building. They are still searching for transport and environmental solutions in future road building projects such as the Lahore ring road and elevated expressway.

The other reason behind traffic and pollution disasters is rapid urbanisation during the last three decades. In spite of the high natural birth rate, being a centre of employment, education and health facilities, people continue to migrate to Lahore. These are the reasons behind its fast growing population at an annual rate of 4.23% (NESPAK, 1997). This growth has brought new demand to travel from the periphery to the central area.

Sustainable Transport Guiding Principles & Indicators

Sustainable transport guiding principles have been developed to streamline the research. These principles can be subdivided into the following categories: economic viability, accessibility for all, ecological sustainability, social equity, health and safety, integrated planning, land and resource use, education

Table 2. Indicators Analysis

Environmental Indicators	*Social Indicators*	*Economic Indicators*	*Transport Activity Indicators*
Greenhouse gas	Urban density	Fuel price	Non motorised transport
CO2 & CH4 emission	Mixed land use	GDP per capita	Car ownership/1000
Ecological footprint	Commute cost/time	Transport land use	Average trip length
NO2, Lead & SPM	Public Transport for poor	Annual new road construction	Traffic volume
Noise	Death and injuries	Road expenditure per capita	Vehicle condition

*. The more black intensity the worse the situation

Source: Authors

and public participation, consensus building through networking, individual and community responsibility. The purpose of these principles is to establish approaches that are holistic, long term and community oriented.

With the help of these guiding principles, short lists of indicators have been designed to provide a basis for monitoring progress in Lahore towards or away from sustainable transportation and to provide a better understanding of the dynamics of Lahore's transportation systems in relation to sustainability (Appendix 1). These indicators are also suitable for providing meaningful cross-jurisdictional comparisons in order to contribute a better understanding of the consequences and to help provide a basis for policy development as well as monitoring of results. These indicators have been developed in three main categories, each with several sub-categories. The three main categories used correspond to the main domains of sustainability: environmental, economic, and social. The environmental domain is the most extensive in terms of the number of indicators. Emissions and Concentration, and Eesource Use are the sub-categories in this domain. The social domain represents indicators related to Health and Safety and Accessibility. The economic domain has been categorised into Pricing and Taxation, and Expenditure and Subsidies. Some of the indicators related to transport have been established under transport activity indicators.

Evaluation

To evaluate how far is the existing transport system of Lahore from a sustainable transport system three broad analyses have been done in this research. These include transport policy, indicators and current project analysis.

Transport Policy Analysis

First, comprehensive urban transport policies across all sectors were analysed under sustainable transport principles. Ideally transport policy documents guide the development of transport at national level. However, Pakistan has no clear policy document on urban transport. In the late 1990s some efforts were made to formulate a National Transport Policy. But still no such policy has been approved. Until now three drafts transport policies have been proposed. These were prepared by three separate agencies: the Chartered Institute of Transport, Pakistan, the Planning Commission and the National Transport Research Center (Imran 2002).

In Table 1 we have tried to evaluate these policies under broad categories of sustainable transport principles, which show the overall picture of all three-transport policies. It clearly shows that all three-transport policies have tried to solve transport problems in a piecemeal manner. Rather than a holistic approach to the transport system, only specific principles relating to part of the system have been developed. Adopting these policies is not compatible with a long term commitment to achieving sustainability.

If we want to find sustainable solutions to problem of mobility, then we have to give priority to all issues at the same time. This is because transport is a complex web and without integration of environmental, social and town planning principles within an economic framework, a sustainable transport system will remain a dream.

Indicators Analysis

Secondly, sustainable urban transport indicators have been applied with the help of existing data and assessment criteria (Appendix 2). The summary evaluation given below is based on varying degrees of shading according to the availability of data and how it fulfils those criteria (Table 2). The benefit of this evaluation methodology is that a broad picture of the existing transport system of Lahore will clearly be seen. Although comprehensive data is lacking, efforts have been made to analyse the existing transport system of Lahore under established criteria.

Analysis shows that the overall performance of city transport in moving towards sustainability is very poor. Especially in the environment sector the figures are approaching dangerous limits. But some potential

opportunities offered by the city also came into picture. These are related to the mixed land use characteristics of the city in certain areas, the high density population in the core, the high level of non-motorised and pedestrian trips, relatively low level of automobile ownership and comparatively small emissions of green house gases. If policies were adopted to encourage these opportunities in future then they would help to establish a sustainable urban transport system. However, most of the indicators need serious attention to reduce the effect of negative factors on the city.

In conclusion, the overall picture shows that Lahore is not only far from developing a sustainable transport system but also in some respects going in the opposite direction. The past approach of road building and road expansion is still continuing as the favoured remedy for traffic congestion and environmental improvement. Road building and road expansion will be needed from time to time in all urban areas as part of a balanced transport strategy but this should never be regarded as the solution to all congestion or access problems. Massive expansion of road capacity may in fact make the underlying imbalances and trends worse.

Current Project Analysis

Finally, ongoing projects have been reviewed in order to analyse government efforts towards improving the sustainability of the transport sector. These projects include the Fuel Efficiency in Road Transport Sector project, the National Environmental Action Plan, the Environmental Awareness Program, the Facilitating Women's Mobility Project and the Lahore Urban Transport Project. Some efforts are also being made to reduce the use of pressure horns and to improve the ambient air quality. These on-going projects are mostly funded by the transport and environment focussed international donor agencies but none has the aim of establishing a sustainable transport system in any city of Pakistan. All the projects are implemented only for their specific goals in a scattered way rather than an integrated approach. Projects relating to clean vehicles and clean fuels have come to be seen as panaceas to solve pollution problems from transport in cities. But Lahore needs to do much more to clean up their fuels and vehicles if its air is to become healthy again.

Sustainable Transport strategy

Using the SUSTRAN (2000) framework, the main aim behind this proposed strategy is to achieve a city:

> 'Where it is pleasant and safe to walk to shops, parks and schools. Where streets are safe to cycle on, cross or even children to play on. Where work is not far away or is easily reached by bus. Where it is safe to take the bicycle to the nearest rail station or bus interchange. Where buses move quickly in bus lanes and get priority at traffic lights. Where you don't need to go away for fresh air and do not have to shout over traffic noise. Where the city is quiet but fully alive' (SUSTRAN, 2000).

In earlier work Imran (2001) has proposed a comprehensive future strategy that suits a particular city according to its social, economic and environmental needs. Policies considered important for sustainable urban transport in Lahore are formulated in relation to town planning and to improving the wellbeing of different stakeholders. This strategy can only be summarised here. It includes the following categories:

- For *environmentally sustainable transport,* a strategy has been proposed to address the health-threatening impact of transport in terms of improving road safety and reducing air pollution. An environmentally sensitive strategic framework has been developed to make policies for congestion, pollution and road user charges, public transport fares, integration of urban structure and transport planning, changing the balance of modes and to make environmental and economic polices complement each other.
- Policies of *socially sustainable transport* are formulated to provide the poor and other disadvantaged groups with better physical access to employment, education and health services. Meeting the transport needs of these disadvantaged groups, recommendations emphasise the role of the informal sector and non-motorised transport. Transport equity and justice is given priority in a socially sustainable transport policy.
- The overall objective of an *economically sustainable transport* strategy is to increase the responsiveness of transport supply to user needs by creating competition and by enhancing user participation. True charges for the use of infrastructure and services, commercialisation of public sector firms and proper public transport pricing are other principles of this policy.
- Finally, *town planning measures* provide some of the most promising transport planning policies in the growing 'tool kit' of ways to bring us closer to sustainable urban transport in Lahore. There is a strong emphasis on approaches that are integrated, long term, pro-poor, holistic, focused on accessibility, aiming to enhance urban quality of life, economic thrift and prosperity by providing town friendly transport modes. Strategies have been proposed for replacing old policies regarding parking, car growth, road building, vehicle speeds and formulating new policies for good governance, telecommuting and community transport. As we can't achieve a sustainable transport system without empowering all stakeholders, strategies

have been formulated to incorporate these elements in an integrated way.

The above sustainable urban transport strategy has been developed for Lahore bearing in mind the need to strike a balance between the ability of transport to serve economic development, the ability of the environment to sustain future quality of life and the ability of society to fulfil their needs of accessibility freely. This strategy emphasises approaches that are holistic, long-term and community oriented.

Discussion & future research

For commitment to sustainable development principles, urban areas of Pakistan need to revise their transport policies and programs. This will only be possible when there are standard criteria for evaluating existing policies. The best approach will be to develop national sustainable urban transport indicators which will provide a better measure of the dynamics of the country's transportation systems in relation to sustainability. Although urban transport policies are local in nature and must be tailored to fit the profile and context of the particular urban area, the long-term impact and effectiveness of local policies and measures can be compromised, if at national level, the policy framework for spatial planning, financing, investment and pricing schemes does not accommodate and support these local policy initiatives. That's why these national level sustainable transport indicators will have to establish links between national objectives for transport, environment and health and those in local areas. These indicators will help to reshape urban transport programs to make transport more cost effective, to ensure environmental protection, and to increase social sustainability in Pakistan.

However, the development, application and implementation of these indicators are really a challenge due to the absence of clear operational definitions and the ad hoc polices of government toward transport and environmental issues. One of the biggest challenges to implementing sustainable urban transport strategies is to identify and overcome institutional and organisational barriers. Co-ordination and co-operation among different branches and levels of government, as well as efficient consultation and communication between government and the public can determine if policies are implemented or not. This co-operation is essential to ensure that packages of complementary policies designed to promote sustainability, rather than 'isolated measures' are implemented. These implementation problems are not the same, nor are they experienced in the same way in all countries. Particular economic and political structures, as well as social and cultural factors, can engender particular implementation problems.

From the above review of project analysis, it is clear that Lahore is making progress in developing policy schemes to confront congestion and to tackle environmental problems. However, serious difficulties persist in putting these policy plans to work in an integrated way. The main hurdles to surmount are the institutional barriers to implementing sustainable transport policies and programs. Identification of these institutional barriers is very important, otherwise a well thought-out strategy does not guarantee that the goal of sustainable transport in the city will be achieved. In most cases, these institutional problems are often not adequately considered when strategies are defined. In this way, implementation problems are really a reflection of inadequate policy-making.

These challenges draw attention not only to the need to rethink urban transport programs and policies but also the reshaping of institutions responsible for implementing these indicators and policies. That is why in depth research is required to identify and overcome institutional barrier for implementing sustainable urban transport policies in Lahore. To research these barriers we have to identify the power structure in Pakistan society and come to know how it influences urban transport policies and programs. After that we will be able to know the real intention of current policies in Lahore that are making the city unsustainable. This will help to determine the right track for transport institutions which will facilitate sustainable urban transport.

Conclusion

In conclusion, research has revealed that there is no single solution to achieving sustainable urban transport in Lahore. Lahore urban transport cannot be considered in isolation because it has intimate interactions with the whole pattern of urban development. These interactions take place over both the short and long term. Therefore, only those solutions should be adopted which are long term; otherwise current short-term results will lead to a disaster in the long term. A program package is expected to be more effective if co-ordinated with other short, medium and long term measures. Moreover, there is a need to combine the development, application and implementation of national level sustainable transport indicators with in depth institutional analysis.

Note

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Australia and a M.Sc dissertation 'Cities for citizens not for cars: Planning for sustainable urban transport system, Case Study: Lahore, Pakistan' in the Centre of Urban Planning and Environmental Management, University of Hong Kong.

Appendix 1. Major indicators of sustainable transport in Lahore

	Environmental Indicators		***Social Indicators***		***Economic Indicators***		***Transport Activity Indicators***
a)	*Emissions & Concentration:*	*a)*	*Health & Safety:*	1)	GDP per capita	1)	Percentage of urban trip not by automobile
1)	Greenhouse gas emissions from transport	1)	Death & injuries			2)	Automobile ownership per 1000 population
2)	Carbon emission per capita	2)	Medical cost of disease due to pollution	*a)*	*Pricing & Taxation:*	3)	Road Utilization Index
3)	NO2 emission			2)	Gas & diesel fuel price at the pump	4)	Traffic volumes of road
4)	Lead emission			3)	Transport Cost index	5)	Modal Split (portion of trips made by each mode), assuming that more diversity is better
5)	Methane (CH4) emission; emissions of ozone depleting substance			4)	Pricing & Taxation	6)	Average trip length
6)	Suspended Particular Matter					7)	Public transport route length
7)	Air pollution					8)	Vehicles conditions
8)	Final energy consumption					9)	Road traffic density
9)	Day & night time noise level					10)	Length of railway & main roads
b)	*Resource Use*	*b)*	*Accessibility:*	*b)*	*Expenditure & Subsidies:*		
9)	Petrol quality	3)	Commute cost	5)	Total area of land under transport use per capita		
10)	Fossil fuel consumption per capita	4)	Average commute time, lower is better	6)	Annual new road construction		
11)	Non-fossil fuel use per capita	5)	Quality of pedestrian & bicycle environment	7)	Total road expenditure per capita		
12)	Ecological footprint	6)	Quality of public transit service particularly non-drivers	8)	Average portion of household expenditure devoted to transportation (including vehicle expenses, fares, parking cost & taxes)		
13)	Transport waste	7)	Affordability of public transit service by lower income residents	9)	Investment dedicated to environmental protection		
		8)	Transport for women, elderly, disable &				
		9)	Parking supply in CBD	*c)*	*Others:*		
		10)	Mixed Land use	10)	Employment density		
		11)	Overall urban density	11)	Medical cost attributed to transportation		
		12)	Residents participation in transportation & land use decision making				

Source: (Imran, 2002, pp. 62-64)

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Appendix 2. Criteria for assessment of indicators

1) Limits Emissions within the Planet's Ability to Absorb Them
2) Limits Wastes within the Planet's Ability to Absorb Them
3) Minimises Consumption of Non-renewable Resources
4) Reuses and Recycles Components
5) Minimises the Use of Land
6) Minimises Production of Noise
7) Meets the Basic Access Needs of Individuals
8) Meets the Basic Access Needs of Society
9) Consistent with Human Health
10) Consistent with Ecosystem Health
11) Access Needs are Met Safely
12) Access Needs are Met Consistent with Equity within the Present Generation
13) Access Needs is Met Consistent with Equity Across Generations
14) Is Affordable?
15) Operates Efficiently
16) Offers a Choice of Transport Modes
17) Supports a Vibrant Economy (Gilbert 2000, pp. 33-40 quoted by Imran, 2002, pp. 64-75)

Local mobility management & urban renewal in public-private-partnership – the example of the 'Car reduced living in an existing residential area at Johannesplatz in Halle/Saale' demonstration

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Abstract

The 'Car-reduced living in an existing residential area at Johannesplatz in Halle/Saale' demonstration is the first attempt in Germany to realise car-free living in an *existing* residential area. It contributes to a more sustainable city and mobility. At Johannesplatz, a local mobility management and urban renewal process has been initiated. The process started with a traffic experiment.

This interim report describes the background, the aim and the approach of the ongoing project as well as the current status of project development. It shows the implemented measures of the traffic experiment, their positive results for environmental quality and the degree of acceptance by the residents.

The main focus is on the successful co-operative planning process of a public–private partnership between the municipality of Halle/Saale and a local housing company. The realised measures have been intensively discussed in a permanent participation process with the people living at Johannesplatz and have been carried out in consensus with them.

Keywords

Car-reduced living, Halle/Saale, mobility management, urban renewal

Background

The 'Car-reduced living in an existing residential area at Johannesplatz in Halle/Saale' demonstration is the first attempt in Germany to implement car-free living in an existing residential area. It is an essential part of the 'Development of environmentally friendly shopping and leisure transport in the Halle/Leipzig region' project which has been carried out since September of 1997 by the Wuppertal Institute in collaboration with other project partners on behalf of the German Federal Environmental Agency (UBA).

'Car-free living' is one way towards achieving a more sustainable transport system. Whoever wants to live 'car-free', which is without individual ownership of a car, should be enabled to live in a car-free city district and to enjoy the advantages of the car-free living environment to which they contributes: more tranquillity, safer roads, better air quality, more green spaces, more space for pedestrian and bicycle traffic, more public spaces and more and safer spaces for children to play.

So far, urban and transportation planning has concentrated on the development of newly built car-free residential areas. On this matter there is a whole range of realised and successful examples, and more are being planned (see for example http://www.ils.nrw.de/Projektnetzwerke/Autoarme Stadtquartiere). The focus on existing residential areas is just as important, since the problems caused by moving and stationary motor vehicles are especially urgent. Existing urban areas are – merely considering the quantity – far more numerous than areas in development. Living takes place primarily in existing urban areas.

In car-reduced existing urban districts, the public space is redesigned – as far as practicable – to be free of moving and stationary motor vehicles. In addition, a district-bound mobility management structure supports car-independent mobility. On the one hand, the already car-free living households will benefit therefrom, while on the other, car-owning households could be convinced of this 'new' way of life.

Using these considerations and in line with my own research work, I have initiated the 'car-free living in an existing residential area in Halle/Saale' demonstration. The city of Halle, about 150 km southwest of Berlin, has the lowest motorisation rate in Germany. On January 1st 2001, there were 386 cars per 1000 inhabitants. For comparison: the national average at this time was 533 cars per 1000 inhabitants.

Objective & approach

The objective of this demonstration is – for the first time in Germany – to change an existing residential area into a car-free district with a realistic and practicable concept, to put it to the test and to evaluate

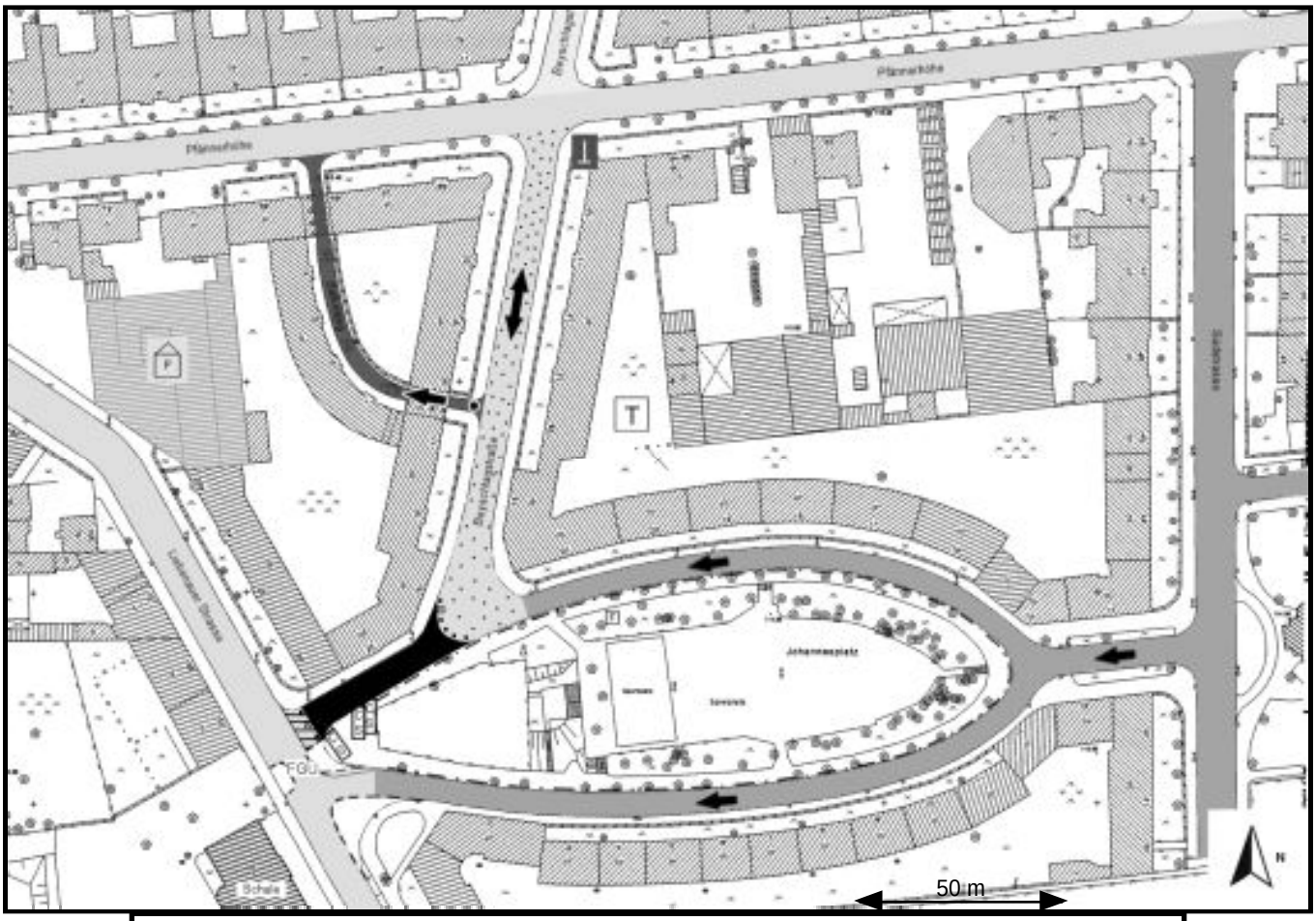

Figure 1. The Car-reduced living at the Johannesplatz in Halle/Saale Demonstration Project of the Federal Environmental Agency

- car-free road section
  - pedestrian and bicycle traffic allowed
- car-reduced service road
  - no motor vehicles
  - pedestrian and bicycle traffic allowed
  - delivery service allowed
  - no parking
- zone with speed limit of 30 km/h
- road section with speed limit of 30 km/h
- road section with speed limit of 50 km/h
- car-reduced residential street
  - pedestrian and bicycle traffic allowed
  - residents only
  - zone with speed limit of 30 km/h
- prohibited zone (lane markings)

- CS car-sharing station of teilAuto Halle
- T discount on regular bus tickets for tenants
- F parking facilities for bicycles
- (fixed) bollard
- X pole (moveable)
- collapsible bollard
- two way traffic
- one way street
- dead-end street

medium-term planning

- FGU crosswalk (moving)
- P parking garage (planned)
- new lane demarcation

Wuppertal Institute für Climate, Environment & Energy – Transport Division, June 18, 2001

it. With this experimental approach, new and generalisable experiences about the project's potential and adaptability should be gained.

Existing residential districts have to be reorganised into more or less car-reduced areas subsequently and gradually. Therefore, an integrated local mobility management and urban renewal process of the existing residential district around Johannesplatz in the southern city of Halle / Saale was initiated. This urban district, which was dominated by the car, is now in a process of reorganisation and remodelling towards a car-reduced (and perhaps in the long-term towards being a car-free) urban district, in which people can live independently of owning a car and enjoy the benefits of a car-free district.

The Wuppertal Institute is advising, moderating and evaluating this urban renewal and local mobility management process, which is being undertaken by a public–private partnership between the municipality of Halle / Saale and the housing co-operative 'Bauverein für Kleinwohnungen e.G.', which owns the housing at Johannesplatz.

The former situation at Johannesplatz

At the start of the project in 1997, the then existing traffic situation in the city-close residential area at Johannesplatz was marked to the usual degree by car traffic. 60% of the households were motorised, 40% lived car-free.

The area was built between 1908 and 1933 with three-storey blocks of houses. It was not originally designed for the mass motorisation of the post-reunification-era in East Germany.

The car-owning residents complained about a lack of parking space for their cars and at the same time worried about the cars of others. Especially the far-too-fast non-residential through traffic was a problem because of noise, emissions and risk of crashes.

Co-operative planning

This was the situation when in 1999 and paralleling building restoration, we started an 'integrative mobility management and urban renewal process' in a co-operative planning mode.

For that purpose, a public-private partnership was founded, with the City of Halle, the public partner, and the housing co-operative 'Bauverein für Kleinwohnung e.G.', the private partner. The project approach was specified between the two project partners in a written contract detailing the objectives, the measures and the procedures of the 'car-reduced living at Johannesplatz' traffic experiment, and it was presented to the public. In addition, the two local mobility service companies, the public transportation company 'Hallesche Verkehrs AG (HAVAG)' and the car sharing company 'teilAuto Halle', supported the project development.

The main actors have some similar and some different interests. The City of Halle manages the urban renewal of this inner-city living area, improves the living environment, integrates a mobility strategy in favour of car-independent mobility and works for the realisation of the 'car-reduced living' project. The housing company manages the restoration of their buildings, is also interested in the improvement of the living environment and the upgrading of the inner-city living area. It wants to rent its apartments successfully and is therefore very much interested in the contentment of existing tenants as well as new tenants who just recently moved in. The residents are also interested in the improvement of their living environment, especially traffic calming but they oppose any restriction on their own vehicles. Finally, the UBA and the Wuppertal Institute are both interested in a successful development and realisation of this project. Consequently, they are mediating between the project partners and the neighbourhood and are gaining valuable data from this experimental research project.

In the beginning, these actors approached the project from quite different perspectives. The UBA, the Wuppertal Institute and the City of Halle followed a top-down route to the far-reaching concept of car-free living; the residents should live in an environment as free of cars as possible, without owning a car of their own. As a bottom-up idea, the residents and the housing company favoured the civilising influence of traffic calming; the residents wanted to live in a traffic-calmed living environment, without being restricted too much in their personal use of their cars.

In the project, there was an intensive mediation about these different approaches. An intensive process of communication and participation between the project partners City of Halle and the housing company and between these two and the residents took place. From this dialogue emerged a typical compromise: 'car-free living' became 'car-reduced living' and was introduced as a traffic experiment.

First of all there were many meetings with the project partners to decide about each step of the project development. The Wuppertal Institute facilitated the negotiation process and the meetings. At the beginning we had several separate meetings with each project partner. These one-to-one conversations were used to clarify the different interests of the project partners and to open them up for the others' point of view. Some meetings with both project partners took place. Finally, we had two top-level, decision making meetings with the head of the Planning Department of

Photo 1 & 2. Situation in the residential area at Johannesplatz in Halle/Saale before the start of the traffic experiment (summer 1998)

the City of Halle and with the executive director of the housing co-operative.

Early and intensive participation of the residents in the project development was crucial. We had about fifteen meetings with interested residents. We discussed intensively, openly and sometimes very controversially the vision of 'car-reduced living', the concept of the traffic experiment and all proposed measures. In support of this participation process, the City engaged a neutral, professional moderator. He was permanently in the area with an office and regular consulting hours.

Initially, there were two major residents' meetings marked by a stirred up and conflict-ridden atmosphere and heavy arguments about the different concept ideas. Because of this, we later organised many minor neighbourhood evenings. Here, some acceptable compromises were developed in a more objective working atmosphere. Partly the residents only met with the neutral moderator and argued with each other. Partly the residents came together with the neutral moderator, the City of Halle, the housing company and the Wuppertal Institute. These neighbourhood evenings worked very well and produced some appropriate and useful proposals.

During these neighbourhood meetings it became clear that the vast majority of the residents welcomed the central idea of a perceptibly car-reduced residential area as 'car-reduced living' because of the connected advantages and quality gains. But the residents explicitly rejected a number of separate measures as well, which were originally considered. Consequently, these measures (e.g. the 'Creation of a temporary car-free zone in the afternoon or at night' or the 'Creation of a car-free road section with bollards which can be removed by the residents only') were put on-hold or discarded altogether. On the other hand, the residents proposed measures themselves, which could partly be realised. All the agreed-to measures have been implemented in consensus with the stakeholders and particularly in consensus with the residents.

To sum up there were some important keys to success during this process of co-operation and communication. Concerning the co-operation between the City of Halle and the housing co-operative, the following points were crucial:

- determined project partners,
- intensive and continuous communication,
- objective and impartial mediation between the project partners in favour of the project idea,
- permanent attendance by the Wuppertal Institute, and
- creative search for possible and practicable solutions.

During the communication between the project partners and the residents, things depended on:

- a really open-minded participation process,
- an intensive and continuous communication,
- a neutral moderation among the residents, and between the project partners and the residents, and
- a fair dealing with the residents – they immediately knew whether they really were being treated with respect and sincerity.

Finally, confidence building on the working level between all the actors is a very important key.

Traffic experiment & implemented measures

The integrated urban renewal and local mobility management process that started with a traffic experiment limited to two years is not yet finished. Figure 1 shows the first steps that have been made successfully.

Since the summer of 2000, we are testing an area-wide system of car-free, car-reduced and traffic-calmed road sections with different quality standards. For this, the City of Halle and the housing co-operative are working closely together.

Since July 2000, a speed limit of 30 km / h for all roads in the project area and for both directly adjoining residential trunk roads has been implemented. The western side of Johannesplatz opposite a school was extended with provisional lane markings (white prohibited zone) into the roadway. Here, the 'land reclamation' was done in favour of pedestrians, in order to increase safety on the way to school.

Many illegal parking spaces on the edge of the public garden at Johannesplatz were closed, despite vigorous protests from the car-driving residents. The tarmac covering these parking spaces was removed; the recovered spaces were converted into a green area and re-integrated into the 'Johannesplatz' public park.

Since November 2000, a road section on the northern side of Johannesplatz has been turned into a permanent car-free area by erecting fixed bollards, and has thus been removed from the motorised traffic network.

The spatial concept of car-reduced living was associated with a concept to promote a car-independent mobility of the households living there. Thus, the primary decision of a private household whether to live with or without car is affected. If we succeed in stabilising the households in their decision to pursue a generally car-independent everyday organisation and a car-free way of life, and maybe even win some new households over to this, we contribute effectively to a more sustainable organisation of urban mobility.

The conditions within the project area for

Photo 3 & 4. Situation in the residential area at Johannesplatz in Halle/Saale during the traffic experiment (summer 2001)

pedestrian and bicycle traffic have been perceptibly improved by the area-wide traffic calming. On the residential trunk road, the cobblestones were covered with tarmac such that cycling became safer and more comfortable. The housing co-operative installed several parking facilities for bicycles in the inner yards of their house blocks, and the city of Halle built two public parking facilities for bicycles.

A price reduced *tenants' ticket* was introduced in 1999 in order to make life without a car easier for the residents. The public transportation company offers a discount to the housing co-operative for these tenants' tickets.

Also in 1999, a car sharing station with two vehicles was established, located directly at Johannesplatz. This is a result of co-operation between the municipality, the housing co-operative and the car sharing company of Halle, teilAuto Halle. Effectively, a new mobility service has been introduced which adds to the existing offers of the environmentally friendly transportation modes ('Umweltverbund'). Thus, the car sharing customers who share the 'public car' product have become independent of a private car. There is a strong demand for these vehicles. Indeed, 'teilAuto' wants to double the number of cars at this station from two to four.

Results

Within the framework of complementary research to the traffic experiment, the Wuppertal Institute conducted several surveys in the autumn of 2000 and summer of 2001 in the area. These surveys were used for an interim evaluation of the measures implemented so far and to determine how to continue the traffic experiment.

The traffic census before and after the implementation of the measures show that non-resident traffic – i.e. through or transit traffic – has been reduced by erecting bollards on a section of the street on the northern side of Johannesplatz and by changing the one-way-direction of some streets.

Before these measures, more than 1400 motor vehicles drove through the area between 0600 and 1900 each day. This traffic has shifted primarily to two short road sections of the neighbouring main roads. Due to the area-wide speed limit of 30 km / h, people drive perceptibly slower and more cautiously in the whole area, even on the adjacent main roads.

The use of the car-free road section, separated by bollards, on the northern side of Johannesplatz was systematically observed in a 'social area analysis'. In comparison to other control sites, ordinarily used by motor vehicles, there is a far more generous use (lengthwise and crosswise) of the roadway by pedestrian and bicycle traffic.

During the days of observation, rather many people stayed in the separate car-free section – in contrast to the control sites. Some for a shorter time, maybe up to five minutes, others much longer, over 30 minutes. They talked to each other, smoked or walked their dogs. Children particularly used the car-free space for a longer period of time, to play soccer or to cycle.

At junctions between the closed section and areas with motorised traffic, there was no sign of dangerous through traffic during the days of observation. Furthermore, there weren't any direct conflicts between cyclists and pedestrians in the observed area.

Altogether, the available survey results show that the implemented experimental traffic measures quickly led to a noticeable improvement in quality of life in the residential area, specifically fewer hazards, less traffic noise, reduced emissions, and a more enjoyable outdoor experience.

Consequently, the residents are extremely satisfied with the measures implemented. In our telephone survey among the residents in the summer of 2001, almost three quarters of all people over 18 years old approved of it. Half of the interviewees assess the outcomes to be 'very good' (9.9%) or 'good' (40.1%), and nearly one quarter consider this as 'satisfying' (23.6%). As can be expected, adults living in car-free households gave above average positive or very positive marks while adults in car-owning households were less enthusiastic.

Nearly all adults regard the area-wide introduction of a 30 km / h-speed-limit as extremely positive – almost 88% of the people aged 18 and older give a 'good' (44.4%) or even a 'very good' (42.9%) mark.

The measures aimed at stopping through traffic effectively are strongly approved of as well. Especially the implementation of the car-free area on the northern side of Johannesplatz is assessed positively by nearly three-quarters of all adults interviewed: 27.7% say it is 'very good', 32.5% call it 'good' and 12.9% 'satisfying'.

Also, the change from a road previously heavily used by through traffic into a dead end and thus into a residential road with little traffic is seen positively by more than three quarters of the adults: 31.1% consider the change as 'very good', 33.0% as 'good' and 14.1% say it is 'satisfying'.

The measures to enhance car-free mobility did not show the success initially hoped for – possibly also because of the rather short evaluation time frame. The percentage of car-free households in the 'model area' – evaluated at 40.4% in a pre-survey in the summer of 1998 – decreased to 35.4% during the post-survey in the summer of 2001. This value is slightly better than the

comparable value for the surrounding neighbourhood where no special measures were implemented and where in the summer of 2001 only 34.8% of the households did not own a car.

Additionally, the new car-sharing offer seems rather successful: all residents know of the offer and assess it quite positively: three quarters of the adults consider it 'very good' or 'good'. If we include those that assess the concept as 'satisfying', as much as 96.3% of the residents provide a positive evaluation. 2% of the residents actively use the car-sharing offer and about a quarter can 'visualise' their use of car-sharing in the future. It is therefore quite realistic to hope that as a result of intensified marketing of the car-sharing system, individual car ownership in the model area will not increase in the long term or may eventually even decrease.

Assessment of the project

Based on the results achieved to date, the pilot project may altogether be considered a success. What must be seen critically is that the area cleared entirely of motorised traffic is still rather small.

But, in the model area, we have succeeded in starting a co-operative mobility management and urban renewal process, which is aimed towards the development of a car-reduced residential area; the first steps in this direction have been taken. With the consensus of the local project partners and with the agreement of the residents, we managed to create an area-wide and differentiated car-reduced living environment with car-free, car-reduced and traffic-calmed road sections. On the district level, several measures to promote car-independent mobility were successfully implemented, such as parking facilities for bicycles, the tenants' ticket or car-sharing offers.

Thus, the city district has become a bit more sustainable. Residents are already aware of the improvement in their living environment – safer roads, more tranquillity, better air quality, more green spaces, more space for pedestrian and bicycle traffic, more public spaces and more and safer spaces for children to play. The car-reduced redesign of the residential area is widely accepted by all project partners and residents and will presumably be maintained in the long term.

Looking at the generalisable experiences, the experiment at Johannesplatz is to be marked as a success. It demonstrates that the systematic development of car-reduced residential areas in existing districts in German cities at the beginning of the 21st century is actually viable in the planning process. It empirically presents the key factors for project success, and shows practical first steps towards the start of the required long-term mobility management and urban renewal process. Based on the experiences in Halle / Saale, the demonstration will encourage comparable projects of car-free living in existing residential areas elsewhere with realistic expectations concerning the necessary effort and the achievable benefits.

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The sky's the limit: policies for sustainable aviation

Simon Bishop & Tony Grayling
Institute for Public Policy Research, London
http://www.ippr.org
2003
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Price: £20
1999
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Price: $ 125

Reviewed by Professor John Whitelegg,
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The largest import category for air freight into the UK is now fruit and vegetables, accounting for 13% of cargo imports by weight (page 22). This is fascinating because we are constantly told by the UK government, the airlines, the growth-hungry airports and every business group that the prosperity of UK plc depends on the growth of air transport. This means that economic growth is now fundamentally linked to the import of carrots and onions. We live in a carrot and onion economy.

The fascinating thing about the growth of aviation and the many problems that it presents policy makers, citizens and the global environment is the enormous gap between rhetoric and reality. Even sadder is the very clear acceptance by the UK government that all aviation discussion has to take place in a logic-free and evidence free context. The UK government has accepted in its entirety the argument that aviation has to grow and that we have to find the additional cash, land and environment to trash to make all this possible.

This IPPR report is very welcome indeed. It goes a long way to present a rigorous and accurate dissection of the claims made for aviation, and like other reports it concludes that many of the claims are false and that the growth of aviation is not sustainable. The report should really be read together with two other reports that preceded it:

The Plane Truth: aviation and the environment Ashden Trust and Transport 2000, London, 2001. http://www.aef.org.uk/PDFs/5389SainsburyDoc.pdf and

The economics of aviation: a north west England perspective CPRE, 2003. http://www.cprenorthwest.org.uk/research/research02word.doc

All three reports should be read as a package and if they were read as such and assimilated by policy makers then the only logical outcome would be a halt to aviation's rush to expand, a more measured development of all the alternatives to flying and a serious attempt to internalise external costs and 'make the polluter pay' . The IPPR report could not be clearer in its conclusions:

> 'We conclude that unconstrained growth in air transport is not sustainable; the economic and social benefits are outweighed by the economic, social and environmental costs' (p. 11).

The IPPR report goes over ground covered in other reports on this subject but provides a measured overview that is ready to be adopted by politicians. It provides evidence that the much-quoted link between tourism, jobs and air transport is not the unequivocal benefit claimed by the industry. UK tourists travelling abroad spend far more money abroad than non-UK tourists spend here when visiting the UK. Therefore, it would be logical to argue that aviation is a net drain on the economy and not an economic benefit. Aviation is subsidised to the tune of about £9 billion pa through lack of fuel tax, VAT and duty free sales in airports. The industry is also small. It has a smaller contribution to GDP than agriculture (p. 20). Aviation is also still a 'plaything' of the relatively well off. Despite the fall in relative prices 'leisure air travel remains highly skewed towards the better off' (p. 64). This is a significant rebuttal of industry and government claims that in some way the growth of aviation is a huge social gain encouraging lots of poor people to fly. This is not the case.

The authors concludeswith a number of key recommendations. These include the auctioning off of runway slots, the introduction of an EU-wide emissions charge 'to tackle aircraft emissions that cause climate change' and more rail travel as an alternative to air over appropriate distances.

This is an extremely valuable contribution to a centrally important policy debate and many of us will wait with great anticipation to see what government makes of all these ideas as it contemplates a huge expansion of aviation on the back of its own deeply flawed misconceptions of transport, sustainability and economics.

Urban Transport, Environment and Equity. The case for developing countries

Eduardo Vasconcellos
Earthscan, London
http://www.earthscan.co.uk
2001
ISBN 1 85383 727 X paperback
Price: £ 24.95

Reviewed by Professor John Whitelegg,
Stockholm Environment Institute, University of York,

This is an important book. It is written by someone who lives and works in the conditions he describes and it is very refreshing indeed to read a Brazilian perspective on the debate around transport and environment in developing countries. Interestingly the author constantly comes back to the twin concepts of inequity and injustice as key components of any transport system. This is just as true of transport systems in North America and the UK as it is in Brazil but it is only rarely that it is put centre stage.

The book is also a social and political analysis of transport conditions in developing countries with clear links made between policy, technology, environment and social justice. The author puts this forward as 'an alternative approach' based on 5 new concepts. These are:

1. The city is understood as the built environment which helps unveil the relationships between society, space, transport and traffic;
2. The concept of the 'circulation environment' is proposed, encompassing several physical, operational and symbolic features involved in the act of using space;
3. The relationship between social reproduction and transport is defined with the emphasis on the reproduction needs faced by people (related to age, income and gender);
4. Accessibility is defined as the main output of transport and consequently as the main social and political issue to be explored as opposed to the simplistic idea of mobility; and
5. The relationship between the built environment and the means of collective consumption is defined as a basis for analysing the use of roads as public assets.

Not surprisingly the result of this perspective is a set of conclusions emphasising the need for more democracy in developing countries, the control of urban expansion and better income distribution. From this reviewer's perspective this conclusion is just as relevant to transport policy and deliverables in the UK. Successive UK governments have allocated billions of dollars to futile road building projects, outside of any democratic legitimation and in a way that transfers wealth from poorer groups to richer groups. Transport policy is a well oiled machine for ensuring that the relatively affluent groups in the UK get more of their small tax payments back than do poor people.

The bulk of the book is more traditional and provides a well documented exploration of institutional issues, the use of roads, non-motorised transport, public transport, private transport, mobility, environment, energy, traffic accidents and the urban transport crisis in developing countries.

Readers of World Transport Policy & Practice will be especially interested in the section on proposals. Just what do we do next Monday morning to put all this right? Vasconcellos does not let us down here. There is a splendid logic that flows through this book like a 'golden thread' leading to the 27 action points in the final chapter. If anyone 'out there' wants to solve transport problems anywhere and wants to do something rather than keep talking about why we can't do anything, then these 27 action points can be implemented. They can be implemented soon, they will produce a just, fair and democratic society, they will deliver high quality accessibility, they will improve the environment, they will end the death and destruction on the roads imposed by the rich on the poor and they will cost less than current transport expenditures.

Contributions to *World Transport Policy & Practice* are welcome. Whether you are a novice author or an experienced one, the Editor would like to invite you to consider sharing your thoughts and experiences with others like yourself. We can promise a considered and constructive review of your article and, for contributions deemed suitable, publication in *World Transport Policy & Practice.*

Read through the following guidelines and feel free to contact John Whitelegg, the Editor, who will be pleased to offer comments on drafts, work in progress, or ideas which could be made into an article.

Editorial objectives

The journal aims to provide validated information about the latest developments in transport policy to enable local authorities, governments, consultancies, NGOs and supra-national organisations to speed up their policy development and implement new ideas from around the world. It will:

- cover all passenger and freight transport
- deal with global as well as local issues
- include the development of the ideas of sustainability, the design of cities and rural areas, transport corridors and international links to improve health, the economy and the environment.

Article composition

Articles should normally be between 2,000 and 4,000 words. Shorter articles can be published as 'Comment' pieces. Responses to papers which have appeared in the journal, either as letters to the Editor or as response articles, will be welcomed.

Submitting articles

1. By e-mail

Articles for publication may be submitted by e-mail attachment to Pascal Desmond. It is useful if authors indicate what software is required to read any attachments and if they include the letter combination 'zq' in the title. Please DO NOT name articles 'whitelegg', 'wtpp' or variations of these. Authors are advised that they may need to provide a version on paper and/or on 3.5" disk prepared on an Apple Macintosh or PC system.

2. On paper

Three copies of articles, typescript and double spaced with wide margins are needed. Manuscripts will not normally be returned, so you should ensure you retain a copy. Provide the article on paper of no less than 80 gsm weight with high quality print. This will enable electronic scanning if needed. Please supply the same version of the article on a 3.5" disk prepared on a Macintosh or PC system in ASCII format. Mark the disk clearly with your name, the article title and the software you have used. Where there is ambiguity, the disk version will normally be considered definitive.

Presentation

Headings and subheadings should be used at approximately 500–750 word intervals. Ensure that headings and subheadings are clearly identified.

Charts, diagrams & figures

These should be called 'Figures' and numbered consecutively (e.g. Figure 1, Figure 2, etc.). Make sure they are clear and can be reproduced easily. In addition, provide the raw data so that we can redraw them, if necessary. Indicate where in the text they should appear '(Figure 1 about here)'. Each figure should have a brief title (e.g. 'Figure 1. Schematic of the Programme').

Tables

Tables should be numbered consecutively, independently of figures. Indicate in the text where they should appear. Give them a brief title. Ensure that they are clear and legible. Authors should not use many tabs or spaces between columns of data – normally, one tab is sufficient.

Maps

Maps are especially welcome as 'tiff', 'pict' or 'jpeg'. They should be numbered consecutively, independently of figures and tables and their location in the text should be indicated. Ensure that they are clear, uncluttered and legible. They should have a title.

Measurements

SI units should be used throughout.

Abstracts & Keywords

Write an abstract of 75 words or so which summarises the main points of the article. It should be sufficient for a reader to decide whether or not they want to read the whole article. Also note up to six keywords which describe the content of the article. These could include geographical area, if specific, industry, functions, managerial activity and process.

References

Authors should keep references to a minimum, ideally no more that ten to fifteen. References should be confined to essential items only and those that are necessary to establish key steps in an argument or key areas of support for a particular proposition.

Reference citations within the text should be by the author's last name, followed by a comma and year of publication enclosed in parentheses. A reference list should follow the article, with references listed in alphabetical order in the following form:

Books: Surname, Initials (Year of Publication) *Title* Place of Publication, Publisher.

Articles: Surname, Initials (Year of Publication) 'Title' *Journal* Volume, Number, Pages.

Originality

The author should indicate if a paper has been presented elsewhere. If the author does not do so, the Editor will assume that the paper is an original contribution. Papers appearing in *World Transport Policy & Practice* should not be published elsewhere without the written consent of the Publisher of the journal.

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