

The Politics of Sustainable Transport and the Modernisation of Urban Transport in Delhi and Stockholm

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ABSTRACT

This article addresses issues of transport systems taking its examples from Delhi and Stockholm. The introduction of the BRT and a congestion tax in these two cities respectively is presented and discussed in terms of modernisation and sustainable transport. This paper explores the perceptions of politicians and examines some transport plans in the search for the opening of a new window of opportunity in matters of urban traffic. The ongoing high proportion of non-motorised modes of transport and use of public transport in Delhi over the past fifty years gives it a greater political opportunity for creating a more inclusive city than Stockholm. In Stockholm, awareness of the influence of emissions on climate change makes the inhabitants more inclined to accept fees for the use of city streets. Sustainable transport and modernisation of transport systems are seen as key activities, but are perceived and operationalised differently in Delhi and Stockholm. Despite all the differences, some similarities in the development of their urban transport projects have been found. This paper inquires into the planning and operationalisation of transport modernisation and the politics of sustainable transport - with a special focus on the process leading up to the final decision.

Key Words: BRT, Congestion Tax, Urban transport planning, transport policy, sustainable transport, politicians, muddling through, formative moment, transport systems, modernisation, vehicle ownership, Stockholm, Delhi.

Introduction

The role of transport in urban areas has become an ever more important part of city life. Economic growth and a modern lifestyle make inhabitants travel more frequently and for longer distances. Accordingly, the pressure for efficient and sustainable transport leads cities to invest in new transport technology and management of urban traffic. The profiling of a modern city is of huge importance for its competitiveness in the national and international context. For example, politicians are led to develop plans to generate an aura about their cities: in Beijing for the Olympic Games in 2008¹, or in Delhi in time for the Commonwealth Games in 2010.² Their plans aim to increase the attractiveness and the transport efficiency of their cities for visitors to the games, and, more importantly, to make the cities attractive for international investments by multinational corporations.

The purpose of this paper is to explore the perceptions of politicians and examine some transport plans in two capital cities in the search for the opening of a new window of opportunity in matters of urban traffic. Sometimes the modernisation or upgrading of a transport system is seen as a way to improve sustainable transport. Therefore the intention is to review the background and the outcome of one important transport initiative in each city. The processes of motorisation in a well-planned and affluent city like Stockholm, and a rapidly urbanising developing city, Delhi, are completely different. In both cities the final proposal had a long and messy history before being accepted. Of interest in this paper is also the process leading to new ways of handling urban transport. Were agreements about new transport an initiative based on a short and rapid process, or was a lengthy and stumbling process needed to reach a consensus? Politicians take the final decision. They in turn depend on the opinions of the voters and their preferences. The question of preferences is highly relevant in finding out whose preferences and needs will set the agenda for sustainable transport. Politicians walk a tightrope, balancing various kinds of interests. For instance, looking back in history we find that in many cities it was the car-dependent middle class whose needs shaped the use of the street space, and the use of cars has transformed the urban areas.

The selection of these two different cities is motivated by the assumption that the preferences of the middle class will be decisive for the way in which sustainable transport is going to be

¹ <http://en.beijing2008.com/>.

² <http://www.cwgNewDelhi2010.com/>.

materialised. Of crucial importance for the outcome of these initiatives is how transportation systems are perceived by dominant actors, and the ways in which politicians guide the process of motorisation in these two cities. In Stockholm the needs and preferences of the huge middle class has shaped urban transport by means of established ways of influencing the decision making. It is likely that this will be repeated in Delhi as well. Despite having modernised their transport systems, both Stockholm and Delhi need to develop in the same direction, namely to increase sustainable transport. The exploration of ways to increase sustainable transport is carried out by means of two different examples: the Bus Rapid Transit (BRT) in Delhi , India, and the introduction of a congestion tax in Stockholm, Sweden.

In Stockholm, mass motorisation proceeded in tandem with the modernisation and development of a welfare state. Already in the 1930s, automobility was a mature technological system and some decades later mass automobility spread in Sweden (Falkemark 2006). In Delhi, however, mass motorisation was introduced spontaneously as a consequence of rapid economic modernisation within the framework of a huge developing country. In Delhi today, the risks associated with modern technical development are of another order than in Stockholm in the 1950s. Stockholm had a relatively homogenous population and a small-scale, homogenous motorisation process. In Delhi the population is much more heterogeneous in composition (socio-economic background and income) and this mix is reflected in the heterogeneous use of the street space. Delhi's roads have to cater to all the modes present in Stockholm plus hand carts, animal-drawn vehicles, a very high proportion of motorcycles and three-wheeled scooter taxis. When Stockholm was expanding in the 1950s, vehicles were small in number.

Therefore various policies to regulate mass motorisation and to shape the character of the systems of transport have developed differently in these two cities. Stockholm is a modern and planned city, whereas Delhi has developed as a multi-centric city by plan and serendipity. Stockholm is developing less rapidly, making it possible to plan within a relatively stable situation, while the rapid economic growth and urbanisation of Delhi are going to be quite heady. In 2007 for instance, motorisation in Delhi was not much regulated, turning the city into a Mecca for the sale of cheap cars and motorised two wheelers.

In accordance with perceptions of motorisation and political practices, views on the role of the car in societal development and ways of regulating motorisation vary. Decisions about how to

handle growth in transport demand and the ensuing traffic issues are taken by politicians. The underlying assumption has been expressed as follows by the German sociologist Ulrich Beck:

Transport is mostly a means to certain socially patterned activities and not the point of such activities. (2004:26).

The mix of traffic and means of transport changes over time as a response to, *first of all*, social change. *Secondly*, when societies are already dependent on transport arrangements of a particular kind, the transport system plays an active part in the restructuring of social life, economic conditions and the shaping of the city by means of the transport arteries. Extensive motorisation and modern lifestyles re-structure social activities as well as the spatial locations of business opportunities, markets, housing, shops, and work opportunities. This spatial and social change and associated behaviour has been captured by Ulrich Beck in the following way:

Urban analyses have been largely static, failing to consider how the car reconfigures urban life, with novel ways of dwelling, travelling and socialising in, and through, an automobilised time-space. Mobility is as constitutive of modernity as is urbanity, that civil societies of the west are societies of 'automobility'. Car-drivers dwelling-within-their-cars, and excluding those without cars or without the 'license' to drive such cars, produce the temporal and spatial geographies of cities as a function of motorised mobility. Pedestrians and cyclists are confined to small slivers of the urban public, while many public-transport users are relatively excluded from citizenship (Beck 2004: 26).

Other future problems associated with mass motorisation include reduced energy security and, presumably, higher fuel prices. These are likely to become serious difficulties for a portion of the population in the perspective of urban sprawl and longer distances travelled, although in Delhi 43 percent of the work commutes remain less than 5 km, and 85 percent are less than 20 km.³

Accordingly, the study of a system of transport is a complex issue integrating various kinds of knowledge and paying attention to various political interests. In this perspective the meanings that are given to the various parts of the urban transport system are of great importance for the builders of the system (politicians, business). In order to elaborate on this we refer to the meaning of technical artefacts as expressed by Thomas P. Hughes (1989):

³ *Housing Conditions in New Delhi - NSS 58th Round State Sample* (2006) New Delhi, Directorate of Economics and Statistics. 1-72.

[f]ocusing on the meanings given to them [the technical artefacts] by relevant social groups [...] the socio-cultural and political situation of a social group shapes its norms and values, which in turn influence the meaning given to an artefact.

How are transport problems and strategies defined by politicians? In general terms it can be said that the varying significance of transport provides separate meanings to the various modes of transport. These various modes have in turn different functions in a given socio-economic space such as the city. Hence, the outcome is different ways of handling the development of the systems of transport.

The role of urban politics is increasingly important internationally, as some important or global cities have been politically strengthened due to their economic influence (Sassen 2001). In some countries, the politics of the capital city is influencing politics in other capitals by means of global networks and economic relations even at the cost of traditional national politics.⁴ However, modern sectors such as transport are increasingly interconnected by means of global professional networks. At the same time, only a limited number of case studies comparing sustainable transport efforts have been published. So far the method of using two different and contrasting case studies to discuss the globalisation of sustainable transport has not been much employed. The experiences of modernisation of transport in the Stockholm and Delhi urban areas highlight different developmental trajectories, and thereby reveal different societal challenges and ways to cope with the problems of urban transport. Although the imperative to achieve sustainability is present in both cities. The pertinent question is how do they become more sustainable? Despite their differences in political practice, the elected politicians in both cities hold the responsibility and take the decisions.

Methodology

This paper highlights the role of politicians in influencing the urban transport. The text analysis of secondary sources such as official documents, statements, plans and evaluations, has been made. Some examples stressing the perceptions of the politicians and their influence on the process are presented. This paper will not present a chronological account of the historical processes. The perceptions of politicians together with some key issues of sustainability – city density, means of mobility, injuries and fatalities – are scrutinised below, since these factors can be important in determining the road leading towards sustainability. The notion of sustainable transport applied in this paper is derived from definition of

⁴ For further information see the works of Saskia Sassen about the role of politics of global cities, 1982, 1991, 2001, 2006.

sustainability in the Brundtland Commission report *Our Common Future*, the WCED, 1987. The concept of sustainable transport was further developed in the Aichi Statement, 2005, UNCRD, Nagoya⁵. In this statement the need for both national and local level governments to develop and adopt integrated policies, strategies, and programmes incorporating key elements of environmentally sustainable transport is recognised. The content of this statement can be used to discuss and develop the notions of modern transport and sustainable transport, as well as the differences between these two concepts.

The Aichi statement on sustainable transport comprehends three kinds of sustainability: environmental, economic and social. In general there are more capacity building and research efforts dedicated to the environmental and economic aspects than on how to integrate social sustainability into sustainable transport. For this reason the assumptions of the Aichi statement are unique and of interest to this paper. The key elements are defined as: *a) Public health, b) Land-use planning, c) Environment and people-friendly urban transport infrastructures, d) Public transport planning and transport demand management (TDM), e) Non-motorized transport (NMT), f) Social equity and gender perspectives, g) Road safety and maintenance, h) Strengthening roadside air quality monitoring and assessment, and, l) Strengthening the knowledge base, awareness, and public participation.*⁶

Stockholm and Delhi in 2002

Stockholm County is four times larger than Delhi in area, but has a population density thirty-four times less than Delhi . However, the population density of Delhi is only twice that of Stockholm City, which is the central portion of the urban area of Stockholm. The average income in Stockholm is about 25 times that of Delhi in absolute terms, and 4 times in terms of purchasing power parity. Table 1. shows demographic and Household income details of Delhi and Stockholm.

⁵ http://www.uncrd.or.jp/env/est/regional_est_forum/docs/Aichi-Statement-ADOPTED-2Aug05.pdf (accessed Jan 2007).

⁶ *ibid*

Table 1. Demographic and household income information of Delhi and Stockholm.

	Population	Area sq km	Population density pers/sq km	Household size pers/hh	Gross income per capita Euro	PPP Euro
Delhi	14,400,000	1,483	9,710	5	950	5,300
Stockholm County	1,850,467	6,490	285	2	24,246	20,400
City of Stockholm	758,148	187	4,048	2	22,277	18,700

Source: Stockholm⁷ and Delhi.⁸

Car ownership rate in Stockholm is 7.5 times greater than that in Delhi, which is about double the purchasing power parity (PPP) income ratio but one-third the absolute income ratio. One fifth of the numbers of families own a car as compared to Stockholm. However, when one includes motorcycle ownership in the two cities, the gap in vehicle ownership per family decreases significantly – per capita ownership in Stockholm is 3 times that in Delhi, and the percentage of families owning a personal vehicle is only 1.5 times in spite of the huge gap in per capita incomes. The availability of scooters and motorcycles has given 50 percent of Delhi families a personal vehicle at incomes twenty-five times lower than in Stockholm, while the per capita ownership is only 3 times lower. This factor is bound to have a significant impact on travel patterns and modal shares in transport use, and will have a strong influence on the future development of Delhi as its citizens become wealthier.

Table 2. Vehicle ownership in Delhi and Stockholm.

	Cars per 1,000 persons	Motorcycle per 1000 persons	Total personal vehicles per 1000 persons	Households with one or more cars	Percent HH with one or more personal vehicle
Delhi	50*	74*	124	13%	42%
Stockholm County	373	20	393	64%	66% ⁺

* Number based on estimated number of vehicles on the road in Delhi in 2002.⁹

+ Estimate based on motorcycle ownership.

Table 3. shows percentage of trips by different modes in Delhi and Stockholm.

⁷ *Munich-Stockholm – Comparison of the two regions' planning systems and contents* (2003), Regionplane-och trafikkontoret, Stockholm, *Statistics on the Stockholm Region 2003/2004* (2005). Stockholm County Council, Regionplane-och trafikkontoret, Stockholm.

⁸ *Economic Survey of New Delhi 2003-2004* (2005), Planning Department, Government of the National Capital Territory of New Delhi, New Delhi.

⁹ *Report of the Expert Committee on Auto Fuel Policy* pp 1-98. 2002. New Delhi, CSIR, Government of India.

Table 3. The transport modal shares in the two cities.

	Modal share, percent of trips				Taxis per 1,000 persons
	Car	Motorcycle	Public Transport	Bicycling & Walk	
Delhi	8	14	38	40	6*
Stockholm County	52	NA	45	4	3

* Including three-wheeled scooter taxis.

NA – Not available.

The proportion of personal motor vehicle use (including motorcycles) in Stockholm is 2.4 times that of Delhi. The proportion of public transport trips in Delhi is just 15 percent less than in Stockholm, but non-motorised modes are 10 times more prevalent. In addition, the availability of taxis per capita is 2 times greater in Delhi than Stockholm.

Just looking at the above figures would indicate that by any objective criteria the transportation situation in Delhi is what transport planners would term as more sustainable and desirable than in Stockholm. However, this is not borne out by the road safety and air pollution data shown in Tables 4 and 5.

Table 4. Traffic fatalities in Stockholm and Delhi, 2002.

	Fatalities per million population	Fatalities by road user type, percent				
		Car	Motorcycle	Bicycle	Pedestrian	Other
Delhi	118	3	21	10	53	13
Stockholm County	33	66	4	17	13	0

Source: Delhi¹⁰ and Stockholm.¹¹

Table 5. Air Pollution in Stockholm, 2000 and Delhi, 2002.

	Annual mean, 24 h average values, $\mu\text{g}/\text{m}^3$			
	SPM	RPM	SO ₂	NO ₂
Delhi	476	179	9	48
Stockholm County		15	3	20

Source: Delhi¹², Stockholm.¹³

¹⁰ *Road Accidents in New Delhi 2002* (2003). New Delhi Traffic Police. 1-189. 2003. New Delhi.

¹¹ Tegner, G. The Impact of Road Safety Interventions in Stockholm: Linking Road Demand, Accidents, Severity and Speed in a Model. pp 1-23. 2003. Solna, Sweden, TRANSEK Consultants.

¹² *Ambient Air Quality Status for Ten Cities of India 2002*. Report 12, Nagpur, India, National Environmental Engineering Research Institute, 2003.

These data show that the threat to life due to road traffic injuries and pollution in Delhi is much greater than in Stockholm. This shows the complexity of transport planning for a sustainable future. It is clear that having the right modal mix and low use of personal transport is a necessary but not sufficient condition for the provision of clean air, safe roads and optimal access conditions in cities.

Stockholm; background

In Sweden, by and large, mass motorisation was introduced in the 1930s when the importance of the national railway was in steady decline. The first regulation on automobile usage was passed in 1906: the so called Automobile Ordinance.¹⁴ Already in the 1930s the car was perceived by economists as bringing economic prosperity and supporting the process of democratisation in Sweden. Sweden was governed by the Social Democrats and the use of private cars was appropriated and regulated in accordance with traditional local social and political values. Since motorised transport was such a new societal phenomenon, it took time to find ways to regulate the system in accordance with any ideological view. After some decades of discussion in the Swedish Parliament, mass motorisation became a part of the welfare state and was supported by the various political parties. In order to decrease the high rate of injuries and fatalities, different ways of regulating the use of vehicles were developed.

In the 1950s politicians were convinced that increased physical mobility by means of modern cars would improve democracy, stimulate economic growth and spur the progress of modernisation. The establishment of a welfare state was highly prioritised. One of the key issues during the electoral campaign (year 1956) was the pursuit of policies that strengthened the role of the automobile in the Swedish transport system. In 1956 the understanding of the potential of the car was expressed as:

Both as a toy and as a useful thing [the car] is difficult to replace with something else. Only some decades ago the ownership of a motorcar was the privilege of the few, a class distinction. It is not like that any longer. Development has been very fast. Now there are car owners in all layers of society, and we shall soon eliminate the remaining barriers. It is reasonable to say that the development of motorisation is the most

¹³ 2005 World Development Indicators – Environment: Air pollution. The World Bank, Washington D. C. http://devdata.worldbank.org/wdi2005/Table3_13.htm (accessed 2006-09-01).

¹⁴ It regulated an early kind of driving license. The stipulated age for driving a car was 18 years, and speed was limited to 20 km/hrs in denser areas and 30 km/hrs in rural areas, e t c (Falkemark 2006: 191).

manifest aspect of democratisation of our time (quoted from *Can we afford the motorcar?* authors' translation, Andersson 1956:3).¹⁵

In Sweden in the 1950s the position of the car in societal development was very strong. The automobile industry, lobby groups and organisations of car users campaigned to further strengthen the use of the car in the Swedish transport system. It was perceived as a vehicle for modernisation and deepening democratic relations.¹⁶ In the late 1980s the Swedish Prime Minister and leading Social Democrat at that time, Mr Ingvar Carlsson went even further in defining the role of the car. He stated that 'the car is a human right'.¹⁷ The content of this message was that everyone, everywhere in the world, should be able to own a car. The idea of general motorisation and an extensive use of automobiles embody the first modern era's belief that societal development lacked frontiers and was 'extending into a limitless future' (Thynell 2003, Hughes 1989). Consequently, the world would be completely motorised alongside general democratisation and the global spread and realization of human rights. However, the debate on 'Limits to Growth' was initiated in the early 1970s by the Club of Rome, and critics of the extensive use of automobiles appeared.¹⁸ But at that time no strategies to confront the side effects of general motorisation were formulated.

Some years later, in 1992, the Swedish Prime Minister and leading Conservative leader, Mr Carl Bildt, was interviewed at the UNCED summit in Rio de Janeiro about his attitude towards the negative consequences of the rapidly expanding automobile society. Mr Bildt expressed the belief that technical development would solve the problems of global car use. He also stated, however, that the Chinese should consider developing public transport rather than mass motorisation.¹⁹ About incorporating driving into the charter of human rights he seemed to have a more sceptical view. The global mass motorisation has spread without any institution being directly responsible for its consequences. It has been integrated into various national or urban contexts without any 'natural master' or given institutional 'home'. Mass motorisation is a large and global technical system without adequate national institutional systems for monitoring and control in the public interest (Thynell 2003).

¹⁵ Quoted in Tengström 1991: 104.

¹⁶ One of the Swedish lead politicians during the 1950, Minister of Communications, Mr Sven Andersson, pointed out "that development of mass automobility is probably one of the most evident expressions of democracy in our times (Tengström 1991: 3).

¹⁷ Bilen tillhör de mänskliga rättigheterna (interview published in Dagens Nyheter, 21 August 1989).

¹⁸ D. Meadows, et al., *The Limits to Growth*, Universe Books, New York, 1972.

¹⁹ *Dagens Nyheter (the Daily News)* 13th of June 1992.

For the sake of the topic of this paper the process of motorisation in Delhi and Stockholm will be divided in two major phases: 1. Background, and 2. Some transport initiatives. To begin with, an account is provided of the urban characteristics of Stockholm and Delhi .

Stockholm: the congestion tax

In Stockholm various ways of modernising urban transport have been adopted. In 1950 the underground began to run, and the city received its modern urban plan. One of the latest and most powerful initiatives is the introduction of a congestion tax in the city centre. Since August 1, 2007, a congestion tax is imposed on Swedish-registered vehicles driving into and out of the Stockholm city centre zone on weekdays (Monday to Friday) between 6:30 and 18:29.²⁰ Already thirty years ago a county bill was laid before the council for economical steering of the car traffic. A number of years later, in 1992, an agreement was reached stating that road investments were to be partly funded by a road toll. However, because of the growing political difficulties caused by the agreement, the national government, which initiated the agreement, withdrew its support in 1997.

However, in 2002 the process leading towards introducing a congestion fee began. In Sweden, a controversial issue among the stakeholders has been the form of proceeds from tolls; whether the congestion charge is to be considered a fee or a tax. In the end it was decided that the charge is to be considered a tax, which means that the Swedish parliament has to decide the level of the charge and how the collected revenue should be allocated (recycled) to different purposes. The introduction of the tax in Sweden was anticipated by a pilot test, the so-called Stockholm Trial, from January to August 2006. All costs for the trial were paid for by the national government. The official evaluation of the trial stated that the congestion tax had reached the three goals, namely to reduce congestion, increase accessibility and create a better environment. According to the evaluation:

The trial cut traffic flows – even more than expected – and the reduction was surprisingly stable if normal seasonal variations are taken into account. In addition, the effects were noticeable further away from the congestion-charge zone than we first anticipated. This also means that several of the feared ‘side effects’ did not materialise. Access was improved, which had a major positive impact on travel times and also

²⁰No tax is charged on Saturdays, Sundays, public holidays, the day before a public holiday or during the month of July, <http://www.vv.se/>.

meant that you could be more certain that your journey would take a specific amount of time.²¹

According to the official evaluation of the Trial, the Swedish national goal of reducing emissions of greenhouse gases was reached as follows:

The Stockholm Trial reduced emissions of both carbon dioxide and particles. This reduction is substantial, to have been achieved through one single measure. As the reduction in traffic took place in densely populated areas, the reduction – mainly of particles – brought a major health benefit to the county as a whole. The health benefit is about three times higher than the benefit that would have been gained had the reduction occurred through an increase in fuel prices. As expected and in general terms, the Stockholm Trial only had a marginal impact on noise levels.²²

Another purpose of the congestion tax was to improve the city environment. This was done by improving the pace of traffic and the air quality, as well as achieving greater accessibility by car. Interviews with cyclists and children in the city centre showed that these user groups experienced improvements. Automobile traffic into the area was reduced by 30 percent, light lorries by 21 percent, and lorries by 13 percent. The following figure shows the reduction of traffic flow at the toll stations (ibid p.16).

²¹ <http://www.stockholmsforsoket.se/templates/page.aspx?id=2431>.

²² *Facts and Results from the Stockholm Trial* – Final version – December 2006 Congestion Charge Secretariat, City of Stockholm, Muriel Beser Hugosson, Ann Sjöberg and Camilla Byström, p13.

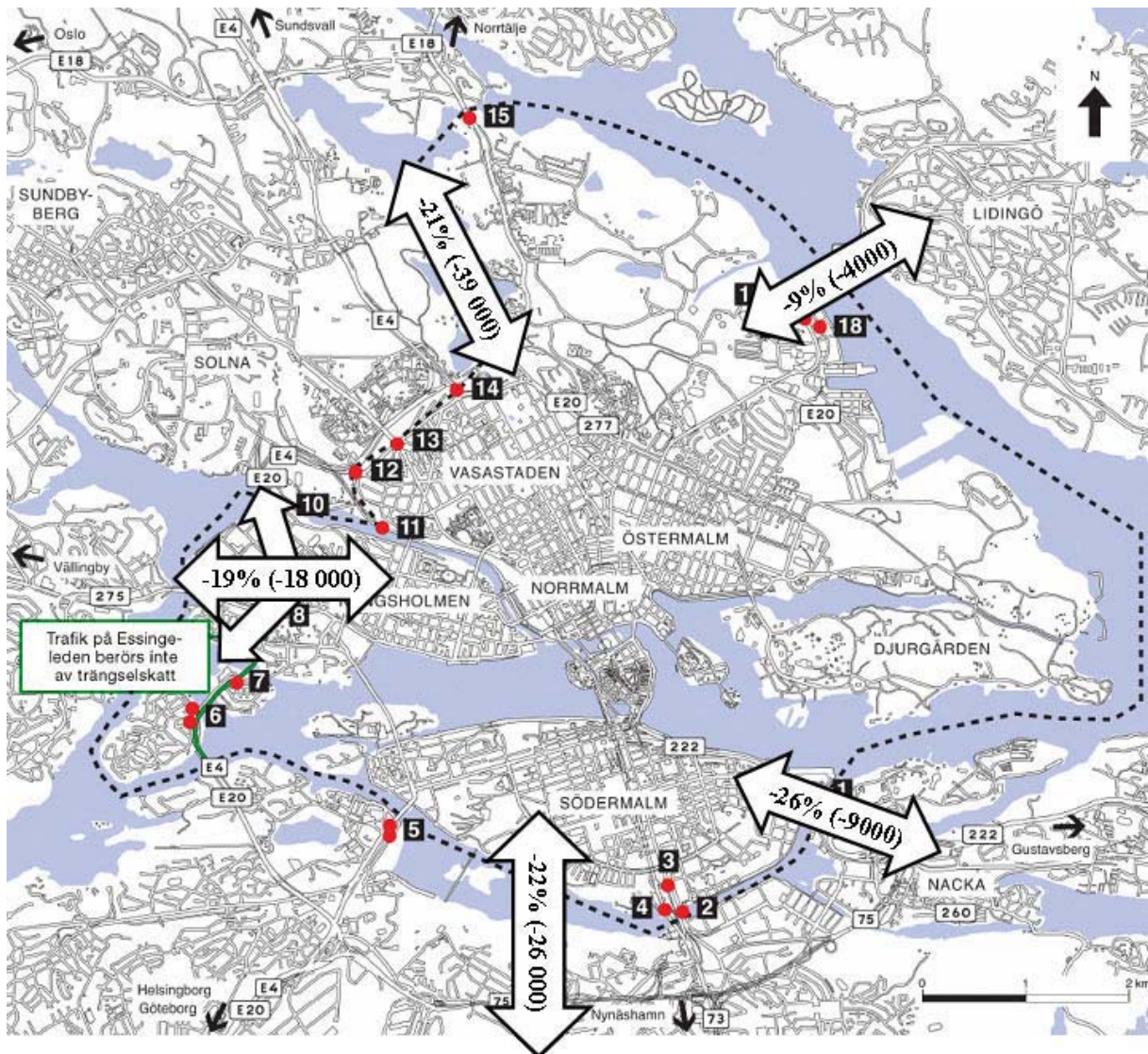


Figure 6. Reduction in traffic flow at the toll stations during paying hours (6:30-18:30).²³

For the public finances the congestion tax is an excellent affair, with a calculated profit of 1.100 million USD/year. This means that when made permanent the arrangement will pay for itself in four years. But the extensions of public transport are a less profitable affair for the various surrounding municipalities in greater Stockholm. Moreover, public transport was augmented with 197 new buses and 16 new bus lines. This provided an effective and rapid alternative for travelling at peak hours from the municipalities surrounding Stockholm into the city centre. Where possible, existing bus, underground and commuter train lines were reinforced with additional departures.

²³ <http://www.stockholmsforsoket.se/upload/Trangselkarta1000x707.gif>.

User reactions

Several different evaluators state that both the general public and business owners have gradually become more positive to the tax and the trial due to their own experiences and after the benefits started to emerge. The official evaluation concludes that public transport passengers appear very satisfied with the direct bus lines.

Residents of Stockholm and owners of businesses have changed from being predominantly negative to having a positive attitude towards the trial as such, and to the congestion tax as a permanent measure.

Essentially, changes in acceptance normally look like this: Before you've experienced something yourself, you mostly see obstacles and expenses, but after you've made your own experiences, you begin to see the advantages and benefits you're getting for your money. There is still great uncertainty however as to how fast these changes in attitudes take place (Facts and Results 2006:17).

The agreement on congestion charges at the national level was made under the condition that an agreement was also to be made at the local level. Initially there was no support from the Social Democratic party at the local level. The Social Democrats found them somewhat forced into an agreement at the local level as well as at the national level although at this national level they enjoyed support from the Green party. Most actors perceived traffic congestion in Stockholm as a problem, though to different extents. The perceived scope of the problem was nevertheless not a cause of disagreement. The major disagreement was instead over the policy measure to solve the congestion problem. For a politician, it would be advisable to implement congestion charges early on in a mandate period. In this way, a negative public reaction may have sufficient time to subside before the next election (Brundell-Freij, and Winslott Hiselius, 2007: 8).

The importance of political agreements

In advance of the 2002 election the local Social Democrats promised that they would not impose congestion charges if they won power in the council. However, as mentioned earlier, there was agreement at the national level on a congestion charges trial in Stockholm. This agreement was finally accepted by the Social Democrats at the local level. As a result, the Social Democrats were accused of betrayal based on their earlier promises (ibid).

The analysis here indicates that local politicians tend to think in terms of the same temporal horizon as national politicians: the election cycle. This is interesting since one might expect

that local politicians would have a longer time frame than national politicians, since it might be easier for politicians at the local level to negotiate with other parties in order to stay in power.

The common point of view was nevertheless that something had to be done about the traffic situation in Stockholm. In this light, it may be seen as more risky for politicians at the local level not to take any actions at all than getting the blame for a less popular policy. On the other hand, if the actions taken are unpopular (like the congestion charge) the politicians at the local level are more likely to be blamed and punished by not being re-elected than the national politicians. Nevertheless, looking at the procurement process, large agreements seems to be a necessity since the time process may be quite long and municipality citizens' reactions have to be handled as well (2007:10).

The time series data provided by the polls in Stockholm indicate that the rather dramatic change in public preferences that occurred in connection with the introduction of the trial was not a consequence of increased information about the program design or its congestion-reducing effects. Evidence indicates that what the public may not have correctly predicted was how much they would appreciate the objective effects that occurred. There is reason to assume that the political decision to include a referendum during the mandate period in the package was at least partly influenced by the fact that (some) politicians anticipated the public's change of attitude (ibid).

What are the plans for the new tax revenues? According to the municipality of Stockholm in 2006: 'The leaders of the four parties forming the new government have said in a debate article in the Swedish morning newspaper *Dagens Nyheter* (1 October 2006), that congestion tax in Stockholm could possibly help finance a new by-pass road'. Accordingly the surplus from the congestion tax will be used to build a new highway around the city centre. This could possibly improve the short-term efficiency of the traffic system, but it will not contribute to its long-term sustainability. In case this government based on an alliance of four liberal parties is supported by important business interest these plans will probably come through. Political experience shows that whenever the Swedish business community unites with the liberal parties they become powerful and capable of ruling political opposition (Falkemark 2006: 265).

Delhi; background

Between 1951 and 1961 the population of Delhi increased from 1.7 to 2.7 million, and the city was characterised by a combination of very high population density in relatively small

areas, and low population density in large areas. This trend in urbanisation and its associated problems were intended to be tackled by the development of a Regional Master Plan for Delhi. This effort was assisted by a Ford Foundation consulting team of seven persons coordinated by Gerald Breese, and the first Master Plan for Delhi was published in 1962.²⁴

The main concern of this plan was to deal with the growth in the urban population, and the planners proposed to restrict it by building a 1.6 km wide green belt around the city and diverting the surplus population to the adjacent 'ring towns'. The city was segregated into zones that kept residential and working areas apart. Public transport networks and land-use patterns were designed to complement the plan. Though the issues of public transport and bicycle paths are mentioned in the plan, the main attention was on the provision of wide roads to enable faster motorised transport. Writing about Delhi in 1963, Gerald Breese states that

The transport 'mix' in large Indian urban areas further complicates circulation...The result of these combinations is a congested flow pattern producing apoplectic dismay among visiting foreign traffic experts... For the urban planner these circumstances give rise to a variety of questions: how to segregate traffic, whether it is possible – or desirable – to recommend a union bus terminal...²⁵

The qualitative description of traffic in Delhi and its attendant concerns does not seem to have changed in half a century.

Table 7 shows the salient features of the transportation situation in Delhi in 1957. Between 1957 and 2002 the population of Delhi increased by about 7 times, the car population about 60 times, motorcycles about 200, and buses 10. It is fascinating that though there has been a huge increase in personal vehicles, the proportion of trips by cars has not even doubled. However, this large increase in cars and motorcycles has preoccupied the concerns of planners ever since, and the main concern has been to provide for more road space and reduce 'congestion'. If we assume that about 30-40 percent of trips were by foot in 1957, and then we get estimates of 60 percent of trips by foot and bicycle, 10 percent by *tonga* and cycle rickshaw, 15 percent motorised public transport, 8 percent taxis including motorcycle rickshaw, 6 percent by car and 1 percent by motorcycle. It appears that over 50 years, the main shift in terms of proportions has been from non-motorised transport to motorcycles and public transport. The number of passengers on public transport dropped from 70 percent to about 40 percent between 1957 and 2002. However, it is interesting to note that though non-

²⁴ Master Plan for New Delhi (1961-1981). New Delhi Development Authority, New Delhi, 1962.

²⁵ Breese, G., 1963, Urban Development Problems in India. *Annals of the Association of American Geographers* 53, 253-265.

motorised transport has always comprised a certain share of trips, the formal plans from 1962 to 2006 do not place enough importance on provision of facilities to these road users.

Table 7. Salient features of the transportation situation Delhi 1957 (adapted from Breese, G., 1963).

<i>Mode Soft modes, Motorised public and private</i>	<i>Trips, number</i>	<i>Trips, percent</i>	<i>Vehicles, number</i>
<i>Soft modes</i>			
Bicycles	400,000	36	146,966
Cycle rickshaws	42,400	4	700
Tongas (two-wheeled horse carts)	136,000	13	3,034
<i>Motorised public</i>			
Bus	252,500	22	1,307
Tramways	14,000	2	
<i>Motorised private</i>			
Motorcycles and scooters	12,500	1	5,715
Scooter & motorcycle rickshaw	87,400	8	1,005
Taxis	60,000	4	1,391
Private cars	110,500	10	10,281

Delhi; Introduction of bus rapid transport (BRT)

The Draft Master Plan for Delhi 2021 is still focussed on widening roads, providing expressways and grade-separated junctions, and a metro system for the city.²⁶ The Draft Plan has no specific provisions for expenditure on pedestrian infrastructure, and restricts bicycle use to collector roads and access streets. While it mentions the desirability of introducing dedicated corridors for buses it gives primacy to the metro system. The focus remains the car, and the car-and-road system would appear to be the winning technology.

In 2002 the Government of India announced a new *Auto Policy* with the objective to ‘Exalt the sector (automotive) as a lever of industrial growth and employment and to achieve a high degree of value addition in the country’ because the ‘Indian auto sector needs to grow collaterally and in harmony with world industry. India has the potential to be a global automotive power.’²⁷ This has obvious implications for the forming of Indian transport and traffic policies.

²⁶ Draft Master Plan for New Delhi – 2021. New Delhi Development Authority, New Delhi, http://www.NewDelhi.com/planning/draft_master_plans.htm (accessed 22 Oct 2006).

²⁷ Auto Policy, 2002, Ministry of Heavy Industries and Public Enterprises, Government of India, New Delhi. <http://www.dhi.nic.in/autopolicy.htm>.

Over the past few years the economy of Delhi has been growing by about 10 percent per year, and vehicle ownership (cars and motorcycles) by about 15 percent.²⁸ In Delhi today the most modern high-speed cars and motorcycles have to share the roads with slow vehicles and non-motorised modes. This level of complexity was never faced by European cities, since the progress of motorisation was of another character a few decades ago. Today, cheap automobiles, also called the Poor man's car, will add to the competition for street space in Delhi. The cheap cars are expected to negatively affect air pollution, public health, and energy use.

Accordingly, the consciousness about global risks associated with chaotic urban transport is being recognised also by the administration. The National Urban Transport Policy stated that 'Travel in the city has become more risky This again has tended to impact the poor more severely as many of those killed or injured tend to be cyclists, pedestrians or pavement dwellers.'²⁹

In 2004 Delhi recorded 1,832 road traffic fatalities, amounting to a rate of 12 per 100,000 persons. In the same year Stockholm County recorded 61 deaths, yielding a rate of 3.3 per 100,000 persons.

The influence of politics on urban transport

At present it appears that Delhi might move in the same direction as Stockholm and other cities when it comes to an increased share of motorised individual transport. Of course, the city is growing together with its population and economic activities, and this motivates infrastructural expansion. New policies and harsher regulations to protect the citizens from the negative consequences of growth will be adopted. Supposedly the intention is to stress the benefits of modern growth, reduce the side effects, and increase sustainability. Apparently the process of improving transport conditions in Delhi can be characterized as a 'muddling through' process. The political economist Charles Lindblom, coined the expression 'muddling through' to describe an incremental process where decisions are consequences of a historical record of previous decisions (Lindblom 1959, 1977). This notion is closely related to what is known as 'soft determinism'. Soft determinism means that past decisions influence and

²⁸ Economic Survey of New Delhi 2002. Government of the National Capital Territory of New Delhi, New Delhi.

²⁹ The National Urban Transport Policy of the Government of India, May 2005.

reduce the scope of possibilities and the number of future choices. Accordingly, there is a soft determinism built into the process inhibiting an alternative path of development. Lindblom further states that this process of gradual and slow improvement or change is much more common than forceful decision taking that aims at rapid change, such as the changes discussed by technicians in terms of breakthrough technologies or strong political decisions such as the Kyoto Protocol of 1995. At the end of the day, the muddling-through process excludes a number of alternatives that were present at the beginning, before any decisions were taken.

In the development and growth of a city, the process of urbanisation includes the opening up of new possibilities which might be considered strategically more important than others. These events or decisions have been called ‘formative moments’, and ‘windows of opportunity’ by political and social scientists (Rothstein, 1992). A ‘formative moment’ is an event or decision capable of redefining future activities. In most cases it is not possible to foresee which of several current decisions will become ‘a formative moment’ since they are part of the everyday process of ‘muddling through’. The moments that turn out to be decisive and change the course of development stand out clearly only in a historical perspective. Accordingly it takes some years before the full effects of a decision become evident.

How can these concepts help us in understanding what is going on in Delhi? While the Draft Master Plan of Delhi (2021) is being debated, two parallel policies have been launched in Delhi. The first is a policy announced by the Government of Delhi in 2002 that Delhi would receive a BRT and starting the planning process for the same.³⁰ The second is the National Urban Transport Policy of the Government of India which emphasises the importance of non-motorised transport – ‘The Central Government would give priority to the construction of cycle tracks and pedestrian paths in all cities, under the National Urban Renewal Mission (NURM), to enhance safety and thereby enhance use of non-motorized modes’³¹. Still this has taken some years, and was commented on as follows in the daily newspaper, *The Hindu*:

³⁰ *Tackling Urban Transport - Operating Plan For New Delhi* (2002), Transport Department, Government of New Delhi, New Delhi. [New Delhigovt.nic.in/trans-pol.asp](http://delhigovt.nic.in/trans-pol.asp) (accessed 22 October 2006).

³¹ *National Urban Transport Policy* (2006) Ministry of Urban Development, Government of India, New Delhi. <http://urbanindia.nic.in/moud/programme/ut/TransportPolicy.pdf> (accessed 22 October 2006).

While it took less than a year for China to launch a high-capacity bus system in Beijing on a 6 km corridor, the Delhi Government has been dragging its feet over the issue.³²

In December 2005, 65 km of a rail-based metro system were completed in Delhi with the expectations of carrying 2.2 million passengers per day. Built at a cost of 2.5 billion US Dollars, it attracted only 0.4 million passengers per day. However, high-profile metro systems easily find political support, and though they fail to satisfy the transport needs of a city, they continue to be funded.³³ Delhi is no different; the construction of the second phase of the metro has been approved and construction is well underway.

Is the decision to introduce the BRT in Delhi the opening of a window of opportunity, and as such 'a formative moment' that can change the ongoing trend of mainstream motorisation? The intense globalisation of the transportation sector might provide new possibilities regarding transport policies and perhaps trigger a 'formative moment'. Or is the opting for a world-class city a formative moment with a bearing on the future urban development of Delhi? Looking back on the history of urban transport, such a formative moment occurred in 1971 in Curitiba when the decision to expand and restructure the city's bus system was taken. At this time an integrated public transport plan was combined with urban land use and road network policies. The decision taken in 1941 in Stockholm to construct a modern underground system has turned out to be of huge importance for the continued urban development of the entire city. Furthermore, nowadays the construction of a metro is seen as an environmental achievement, despite the fact it was decided on because of the perception of its efficiency and capacity by leading politicians in the 1940s.

Finally, and in particular, the banning of diesel in public vehicles in 2000 was perhaps such a formative moment in Delhi. In 2006 this has turned out to be a mixed success – it reduced visible pollution and smoke on the roads, but the rapidly increasing car fleet seems to be wiping the expected pollution reduction. The modernisation of transport systems that is taking place in Delhi in 2007 is closely related to ongoing economic growth and a liberalisation of the economy. However, the perceptions of the leading politicians in Delhi regarding the role

³² 28 Oct. 2005 by Guarav Vivek Bhatnagar. *The Hindu*. Moreover in this article it was believed that high capacity buses may add to chaos.

³³, S M. (2006) Building urban rail infrastructure and image in New Delhi, India. *International Journal of Urban and Regional Research*, 30:2, 277–292.

of the car in providing urban access, or the role of public transport, lead them to take decisions that will be different from those of their colleagues in Sweden.

Technology is perceived as forcing social change towards societal modernisation and spurring economic growth, and the automobile has become the icon of modernisation. The growing risks associated with the rapid increases of traffic in Delhi underscore these difficulties. A multitude of different activities intermingle in urban areas and the globalisation of traffic risks means that poor and dirty mobility becomes a barrier to modernisation of the city and its everyday life. Some examples...NN

Finally, is it feasible that the introduction of the BRTS (in the form of priority bus lanes) as a policy measure in the report mentioned above in Delhi will represent the opening of a window of opportunity? This might very well be the case. And how do the leading politicians perceive these new buses and bus corridors, and what is the role of the BRTS in the marketing of the 'Delhi'? Will the introduction of the BRTS contribute to the profiling of Delhi and eventually become part of an integrated city concept of development? The way in which public transport is handled is part of the re-structuring and re-spatialisation of cities. Well, if these different changes take place, the decision to introduce the new bus systems will emerge as a formative moment with long-term future implications, such a restructuring of the city.

In the next section we will take a closer look at a possible winning technology. Apart from the comfort and safety provided by the BRTS, what other benefits do they offer from the perspective of the dominant actors in Delhi? Modernisation efficiency, economic improvements, less congestion, better utilisation, or less emissions and soft modes?

Pioneering the BRT in Delhi

In the following section an account is made of some core events of the introduction of the BRT in Delhi. This story begins in 1996. At that time Delhi was abuzz with new plans for a mass rapid transit system (MRTS). The MRTS, it was claimed, would alleviate the congestion problems of Delhi and reduce pollution dramatically. The Central Pollution Control Board of India was interested in the latter claim, and asked researchers at the Transportation Research and Injury Prevention Programme of the Indian Institute of Technology Delhi to study the issue and provide them with a comprehensive plan for sustainable transport policies for Delhi. The team spent about a year on the project and produced a report titled *Delhi on the Move*

2005 – *Future Traffic Management Scenarios* in May 1997.³⁴ There were three main ideas in the report: (a) the non-viability of metro systems in many locations and evidence that such systems do not reduce vehicular traffic on the surface, and hence do not result in pollution reduction either; (b) the success of high capacity bus systems initiated in Curitiba (Brazil) and the reasons why such systems would be ideal for Delhi; (c) The need to establish dedicated bicycle lanes on all arterial roads in Delhi as a pre-condition for efficient traffic flow.

First phase: The study was widely reported in the press. The newly appointed Minister for Transport for Delhi took notice of the press reports and commissioned a study to prepare a Bicycle Master Plan for Delhi, which included detailed designs for dedicated bus and bicycle lanes for two corridors. This was the early opening of a window, or the beginning of a process that maybe could have been a formative moment since it included both non-motorised and public transport investments aiming at improvement of low-income trips. This Bicycle Master Plan was submitted in 1998.³⁵ Detailed designs and drawings were submitted to the Government of Delhi along with the rationale for using central or curb-side lanes for buses. However, before any progress could be made at the ground level, the Minister and then the government changed. The usual muddling through resulted in this case in the loss of a process that might have developed into a formative moment.

Second phase: The new Minister of Transport and the Chairman of Delhi Transport Corporation showed renewed interest in the BRT in 2001, and it was decided to organise an international conference on the subject in January 2002. The conference was attended by many professionals associated with BRTS around the world including Enrique Peñalosa, ex-Mayor of Bogotá, Colombia. At the end of the conference, the Government of Delhi announced that it would initiate plans for establishing a BRT corridor in Delhi.

Third phase: Several meetings and presentations later, the Government of Delhi appointed a high level committee chaired by the Chief Secretary to prepare plans for sustainable transport in Delhi. The Committee submitted its report in September 2002 and recommended that seven BRTS should be built. By September 2003 detailed engineering drawings for the first six km

³⁴ Mohan, D., Tiwari G., Saraf, R., Kale, S., Deshmukh, S. G., Wadhwa, S., and Soumitri, G. *New Delhi on the move: Future traffic management scenarios* (1996). Transportation Research and Injury Prevention Programme, Indian Institute of Technology, New Delhi.

³⁵ Tiwari, G., 1999, *Road Designs for Improving Traffic Flow: A Bicycle Master Plan for New Delhi* TRIPP, Indian Institute of Technology, New Delhi.

of the first corridor were ready and an Indian manufacturer was selected to produce the first set of urban buses. In September 2003 elections were announced for the state of Delhi (National Capital Territory of Delhi). The Congress Party included the establishment of the BRTS in Delhi in its election platform. The Chief Minister announced that the construction and establishment of the BRT corridors in Delhi would be the government's top priority item in the transport sector: 'High capacity buses from April'³⁶ Laying to rest all speculation about the implementation of the BRT, the Chief Minister said that putting together the dedicated roads would require more time, as it involved many complexities including coordination between various agencies. In fact, the Transport Minister, Haroon Yusuf, also announced that no such thing as putting dedicated lanes on hold was happening, and that the BRT was moving ahead full steam. In the meantime, officials manning the relevant departments were changed causing further delays in the implementation of the project. Doubts were again raised about the efficiency of BRT versus light rail, monorail and metro systems. Tenders were invited for construction of the corridor, but the prices quoted were found to be too high, as a 6 km length did not provide economies of scale for the contractors. The government then decided to start a re-tendering process for the full 16 km of the corridor.

³⁶ By Staff Reporter, published Tuesday, Dec 23, 2003, *The Hindu*, New Delhi.

Final phase: Work continued with detailed plans for the corridor and getting approval from all the stakeholders before awarding the contract for construction. This is when the objections to the project became more intransigent. The main objection came from the police department, who claimed that taking away road space from cars for use by buses would make efficient traffic flow impossible in Delhi. In the meantime, the Environmental Pollution and Control Authority of Delhi (EPCA) demanded that the government give time specific plans for expanding the public transport system in Delhi as a means of controlling atmospheric pollution. This put the delay in the execution of the BRT project under the purview of the EPCA, and hearings were held to work out the disagreements among the various parties. This process took a few months and all details of the BRT project had to be reviewed again. Finally, under pressure from the EPCA deadlines, the project was approved and tenders invited for the project. A special purpose company was incorporated for the execution of the project and a contractor selected for implementation in September 2006. The work on the first corridor was flagged off by the Chief Minister of Delhi on 4 October 2006 (Figure 1.). In parallel, the Delhi Government has invited proposals for six more BRT corridors in Delhi. The decision in Delhi to opt for the BRTS, as well as the announcement the Government of India's policies on transport planning and urban renewal have resulted in another seven cities in India opting for BRT systems.

Figure 1. Newspaper advertisement announcing launch of first BRT corridor in



Implementation of the BRT has commenced in Delhi, however, at times it seems that accommodating the primary demands of the major stakeholders of the 'Transport Industry' – the Delhi Metro Rail Corporation (DMRC), the public works department, light rail and monorail industry in the planning and investment agenda is the primary focus. The first phase of the metro is carrying 20 percent of the projected trips and facing operating cost losses, yet extensions of metro lines are being actively pursued by the government – both by the bureaucracy and the politicians. Providing efficient and safe transport to the masses and using public money in the most efficient way is not the driving force for implementing BRTS in Delhi . The company which has been instituted to implement the project called Delhi Integrated Multimodal Transport System (DIMTS) is also preparing plans for light rail transit

and monorail. BRT road designs have been modified to 'improve' car flow, so that after the construction of the BRT lanes, car users will not be inconvenienced, even at the cost of safety and access for pedestrians and bicycle facilities. The segregation of bus lanes is seen as increasing space for cars since the buses will not interfere with the cars.

Concluding discussion

The importance of modernisation is recognised by the authorities and the same goes for sustainable transport. In 2007, Stockholm introduced congestion taxes, while Delhi is balancing its needs for the provision of safe walking and bicycling infrastructure, the augmentation of efficient and affordable public transport systems, and becoming a modern 'world class city'. The domination of the upper-class car-based worldview is supported by the middle-class dream of owning one's first car. While in Stockholm, the extensive middle-class, having satisfied its desires for car ownership, is gingerly stepping into worries about sustainability and global warming, in Delhi the demand of the motorists for removing congestion irrespective of efficient bus operations might halt the modernisation of public transport and soft modes. In that case the process of urban renewal will suffer a setback. On the other hand, if the integrated concept of BRTS, walkable cities and bicycling becomes more politically attractive in the face of global warming, there might be a chance to counteract the growing risks associated with the globalised use of private cars. The real threat is whenever capital-intensive projects lose out – metros, expressways and tunnels.

One of the barriers is how to get car owners out of their vehicles and into other forms of transit. This has proven to be a tricky issue, even in times of low rates of automobile ownership. The magnitude of this challenge will greatly increase with the new product for lower income family – the introduction of the poor man's car on the Indian automobile market in 2008. The single car is cheap but the total price on the environment is believed to be important.

The travel preferences made by families with growing incomes are today of decisive importance if new transport strategies to counteract the increasing global risks associated with the modern systems of transport are to become successful. At the same time, the ways of handling sustainable transport in affluent cities are seen as a way of implementing attractive solutions and setting the agenda for newly rich cities.

The notion of sustainability in Delhi is different from that in Stockholm, but in both cases it is articulated by the influential middle class. In Stockholm, the car-owning middle class is still in the majority. Its influence on the politics of mobility is less conflict ridden due to the established political system. In Delhi, the democratic electoral process forces politicians to listen to the lower middle class and the poor majority at election time. However, after the elections, and during policy making, politicians are dominated by upper-middle-class technocrats and experts with different concerns. It is this battle that is leading politicians to examine alternatives to universal technological solutions, albeit very slowly. Politicians look for ways of satisfying their voters' demand for urban access. The way traffic issues are handled in richer cities might be attractive since lessons learned so far shows that behaviour in early modernised cities is being transferred to currently modernising cities. From this perspective, the acceptance of city street tolls, congestion taxes and bicycle lanes in wealthier cities such as Stockholm, London, and Singapore could be an interesting source of information for the growing middle class in Delhi. One of the lessons from introducing the congestion tax in Stockholm is that politicians take the decision early in their mandate, and will enjoy the positive results before the next election.

In Delhi, environmental concerns lead to measures to 'cleanse' the city of pollution and traffic congestion. Both at times hurt the poor by evicting them from city centres, thus denying them access to industrial jobs, or by increasing costs of transport. There is a conflict between the meanings given to sustainability by the rich and the poor. For the rich, sustainability can be achieved through technological fixes – cleaner engines, fuels and metro systems. In wealthy countries, and in a city like Stockholm, the use of 'greener' technology can be controlled by means of taxes – also called economic fixes. For the poor, sustainability is already an adopted lifestyle since their consumption of energy and goods are low. Nevertheless a poverty-stricken lifestyle is not socially sustainable as stated in the Brundtland report 'the essential needs of the poor' (WCED 1987:43).³⁷ The message is that the needs of future generations as well as the poor have to be considered to achieve sustainability. The social differences in Stockholm and Delhi stress the conflict between ecological and social sustainability. The ways of handling this call for different approaches. The explicit goal of social sustainability is

³⁷ Substantial development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It contains within it two key concepts: the concept of "needs," in particular the essential needs of the world's poor, to which overriding priority should be given; and • the idea of limitations imposed by the state of technology and social organization on the environment's ability to meet present and future needs (Hinrichsen, D., 1978).

to improve quality of life through providing opportunities in terms of incomes, housing, health, equity, liveability and so on. Persons having a small ecological footprint need increased access, and for this reason raising taxes on vehicles and energy is not an alternative. Therefore improved access in urban areas by means of sustainable transport is one essential goal.

The continuing high proportion of non-motorised modes and public transport use over the past 50 years in Delhi is due to low incomes and a lack of investments in modern transport technology. This provides another political lever for shaping the future of Delhi into a more inclusive city. In Stockholm, the heightened awareness about the role of CO₂ emissions in spurring climate change makes the Swedish road users inclined to accept a congestion tax. And what is more important – the Swedes were satisfied with the new regulation and its achievement in terms of accessibility, less congested streets, a safer environment for non-motorised users and reduced emissions.

In Delhi, where 13 percent of the households have a car (2005), the transport needs of a significant percentage of low-income families are creating social tensions. This socio-economic conflict manifests itself politically, with no easy or fast solutions. The message from the influential Indian Centre of Science and Environment (CSE) in Delhi is that it is not ethical to tax the new cheap cars. Perhaps the emergence of sustainable transport in a developing urban area will have to be based on the transport needs associated with the lower middle class. The needs and resources of such families could be the point of departure for the design of sustainable transport policies and regulations. For the rapidly growing middle class, structural conditions such as city form, land use and accessibility issues, will have to be addressed in order to increase sustainability. In Stockholm, some debate about the risk of excluding low-income families took place in the media at the time of the trial. This discussion, however, did not influence the final form of the congestion tax. On the other hand, and for the time being, Stockholm can bank on mainly scientific and technical advances with marginal control of transport demand.

Finally, in conclusion, the modernisation of urban traffic is not the same as building a sustainable transport system. The lesson learned from reviewing the experiences in Stockholm and Delhi is as follows. Planning for the BRT in Delhi shows that it will have to be mediated through the inclusion of ‘modernisation’ in transportation discourse. The builders of transport

systems who are engaged in extending mass automobility in Stockholm and Delhi will try to maintain their influence. For instance, in modernising the systems of transport, new and costly technology is applied focusing on modifying (transitioning to CNG, ethanol) and maintaining the car and road system, and only to a lesser extent addressing the light-rail-based modes of transport. The BRT becomes more acceptable when it is shown to introduce modern sleek buses, the use of intelligent transport systems, and gentrification of bus corridors. BRTS are more acceptable when the interests of the transport and construction industry are safeguarded. The extension of the metro system and preparations for introducing a monorail and LRT are not questioned, and they are pursued with the required investments and policies. Will the BRT become the 'winning technology' because it combines these aspects with low capital expenditure? If BRT designs incorporate traffic safety and provision of non-motorised transport facilities and universal design concepts as integral to its functioning, it is possible that this new system will demonstrate that it can lead the city closer to the goal of a 'world class' and 'liveable' city.

In comparing the emergence of sustainable transport initiatives in a developed, and in a developing city, the following can be concluded: Examples of strong government, efficiency or energetic action were not found. Instead decision-making was slow, taking about 10-20 years, and was far from a linear process in the two cities. The initiatives that were finally decided on can be described as a modernisation of the systems of transport, and the process has been characterised by a lengthy muddling-through process. In a long term perspective, the emergence of the initiatives has been messy.

The experiences presented in this paper show that modernisation leads to sustainability only to a limited extent. It can be stated that the decisions about urban transport have favoured modernisation at the cost of sustainability although politicians have aimed to increase sustainability. Sometimes modernisation is perceived or discussed as a way to increase sustainability, but this is not the case. So far the shift of modes from motorised to soft modes has been characterised by political inertia, and there are few lasting large-scale initiatives focusing on soft modes. Perhaps external events such as those related to energy use or climate change will lead to a change towards more modern, but less individual, modes of transport. Furthermore, it seems relevant to review other cities to enrich the experiences and tools that enable politicians to take action. One such tool is the Aichi statement about sustainable transport which was adopted by thirty Asian Mayors in Kyoto 2007, also named the Kyoto

declaration. There is a new window of opportunity being opened – but how far or for how long it will open is not clear. The uncertainty as to what a new window of opportunity will bring about raises the need for further clarification about how decisions maker define and implement sustainable transport.

Extended abstract and summarise some bullet points, Mars 2008, Marie

The role of transport in providing access for an increasing part of the population is a contemporary challenge. Economic growth and modern lifestyles make people travel more frequently and for longer distances. Accordingly, the pressure for efficient and sustainable transport leads city government to invest in new transport technology and more advanced forms of urban traffic management. The profiling or branding of a city is of huge importance for its competitiveness in the national and international context and in line with this politicians are led to develop plans to generate an aura about their cities. For example,; in Beijing for the Olympic Games in 2008³⁸, or in Delhi in time for the Commonwealth Games in 2010³⁹, their transport plans aim to increase the attractiveness of their cities for visitors to the games, and, more importantly, to make them attractive also for long-term international investments by multinational corporations. In this regard the city of Singapore has become a role model of a successful city.

The purpose of this paper is to explore the perceptions of politicians and examine some transport plans in the search for the opening of a new window of opportunity in matters of sustainable transport. Sometimes the modernisation or upgrading of a transport system is seen as a way to improve sustainable transport. Therefore the intention of this paper is to review the background and the outcome of one important transport initiative for each of the two capital cities. The processes of motorisation in a well-planned and affluent city like Stockholm, and a rapidly urbanising developing city, Delhi, are completely different. Still as we shall see, some similarities are found in the lengthy process leading to the final political agreements.

Methodology

This paper is based on text analysis of secondary sources such as official documents, statements, plans and evaluations that have been selected in order to gather the perceptions of

³⁸ <http://en.beijing2008.com/>.

³⁹ <http://www.cwgNewDelhi2010.com/>.

the politicians and their influence on the transport systems in two capital cities. The paper explores some aspects of sustainable transport; city density, means of mobility, injuries and fatalities. The prevailing attitudes of city governments regarding these issues are important in determining the road leading towards sustainability. The notion of sustainable transport applied in this paper derives from *Our Common Future*, the WCED, 1987 and the way it was developed in the Aichi Statement, 2005, UNCRD, Nagoya⁴⁰. In this statement the need for both national and local level governments to develop and adopt integrated policies, strategies, and programmes incorporating key elements of environmentally sustainable transport is recognised. The discussion about sustainable transport is based on these assumptions.

Concluding discussion

- The way traffic issues are handled in richer and developed cities appears like attractive since lessons learned so far shows that behaviour in early modernised cities is being transferred to currently modernising cities.
- The building of a sustainable transport system is likely to take a long time, partly due to the confusion about what is seen as increasing sustainability and what is seen as modernisation of transport systems.
- Sustainable transport and/or modernisation of transport systems are seen as key activities but perceived and operationalised differently in the two cities. In Delhi the latest BRT technology is introduced and in Stockholm a congestion tax is applied in the inner city.
- In Delhi the continuing high proportion of non-motorised modes and public transport use during the past fifty years gives another political lever to shape the future of Delhi into a more inclusive city. In Stockholm the awareness about the emissions' role in influencing climate change make the inhabitants more inclined to accept city road pricing as well as other environmental taxes.
- Planning for the BRT in Delhi shows that it will have to be mediated through the inclusion of 'modernisation' in transportation discourse and not through the notion of sustainable transport. The experiences presented in this paper show that modernisation leads to sustainability only to a limited extent. It can be stated that the decisions about urban transport have favoured modernisation at the cost of sustainability although politicians have aimed to increase sustainability. Sometimes modernisation is perceived or discussed as a way to increase sustainability, but this is not always the case.
- The notion of sustainability in Delhi is different from that in Stockholm, but in both cases it is articulated by the influential middle class and their travel habits.
- In Stockholm, the car-owning middle class is still in the majority. Its influence on the politics of mobility is less conflict ridden due to the established political system. In Delhi, the democratic electoral process forces politicians to listen to the lower middle class and the poor majority at election time. However, after the elections, and during policy making, politicians are dominated by upper-middle-class technocrats and experts with different concerns.

⁴⁰ http://www.uncrd.or.jp/env/est/regional_est_forum/docs/Aichi-Statement-ADOPTED-2Aug05.pdf (accessed Jan 2007).

- Politicians look for ways of satisfying their voters' demand for urban access. One of the lessons from introducing the congestion tax in Stockholm is that politicians take the decision early in their mandate, and will enjoy the positive results before the next election.
- The elected decision-makers depend on the opinions of the voters and their preferences. The question of preferences is highly relevant in finding out whose preferences and need will set the agenda for sustainable transport. Perhaps the emergence of sustainable transport in a developing urban area will have to be based on the transport needs associated with the lower middle class and in particular the transportation habits of men?
- The transport demands and the resources of low income families could be the point of departure for the design of sustainable transport policies and regulations. For the rapidly growing middle class, structural conditions such as city form, land use and accessibility issues, will have to be addressed in order to increase sustainability in the systems of transport. The politicians make trade offs and select priorities before the final transport agreements with the various stakeholders is made.

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