Chapter I

Framing Urban Transport

Urban transport in the last few decades has been subjected to a predominantly technical treatment, as an area that was seen as 'naturally' inclined to physics, mathematics and economics. This traditional approach is now subjected to increasing criticism, as its limitation can no longer be hidden.

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Urban Transport, Environment and Equity

This chapter reviews various frameworks on urban transport and theories on capitalism and urban space. The intention being to situate Delhi’s transport revolution to broader momentums for urbanisation and the creation of neo-liberal spaces. I will, thereby, hope to argue against the current dominant trend that views Delhi’s transport challenges as chiefly comprising problems for planning and engineering interventions. In other words, this thesis will argue for treating urban transport in Delhi as essentially one demanding a political understanding rather than a solely technical framework. That is, a political analysis will help explain more meaningfully the patterns, debates, policy initiatives and constraints that influenced and shaped decisions regarding transport choices that were carried out for Delhi between 1990 to 2006. Thus, this chapter will set the tone and tenor for treating urban transport as belonging to a political domain rather than a debate that only involves technique and technological capacity.

This chapter comprises four sections. The first section will review some studies on urban restructuring in India and will point out that the concern for urban transport in such writings has been either minimal or viewed as belonging to the

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technical domain. The second section will highlight the fact that urban transportation in India is being largely ignored by urban social theorists has thereby allowed the field to be dominated by technical readings on the subject. Put differently, urban transportation in India, in such studies, have been treated as a technical domain rather than a site for analysing political contest and power. Thus, the above two sections will make the case for extending the political into what has broadly been treated as a technological realm. However, this visible gap in scholarship on urban transport in India, as I will argue in the third section, is also similarly played out in studies on urban transport that have been done on different regions and countries, across the world. That is, the dominant tendency has been to view urban transport as primarily a technical subject rather than one involving a political context.

Having therefore identified the limitations that have plagued studies in urban transportation, the fourth section will underline the need for a political economy framework in conceptualising Delhi’s transport revolution. I will argue here that the attempted restructuring of Delhi as a city landscape for global consumption has centrally informed and shaped urban transport policy initiative between 1990 and 2005. In other words, the fourth section will provide the broader theoretical framework to substantiate the above claim; namely the fact that the enthusiasts for neo-liberalism pushed for the transformation of urban transport in Delhi to be realised chiefly as privatised mobility, and was premised on the steady dismantling of public transport. Thus, Delhi’s transport revolution essentially turned on the neo-liberal logic of transforming urban mobility into consumer choice rather than being held as a citizen right.
Perspectives on Urban Restructuring in India

This section attempts to review studies carried out by academicians, activists and urban planners on various aspects of urban restructuring in India. Urban restructuring refers broadly to the reorganisation of economic, political, social and physical space of the city in order to facilitate the flow of global capital. In several ways, the notion of urban restructuring and the debates surrounding it in India, enables us to connect our concerns on urban transport to the changed nature of global capital flows and the latter's implications for city landscapes and invariably to technologies that press for new types of space-time compression.

Theories on globalisation are often treated as providing a conceptual vantage of sorts for most studies on urban restructuring in India. Aditya Nigam argues that the transformations unfolding in the city of Delhi is a step towards setting a 'new global order'. Which Nigam describes as the 'de-territorialisation of the third world metropolis, a sundering of its ties with its national location and its integration with a network of a handful of global cities.'\(^{13}\) Dunu Roy as well, reinforces Nigam's claim, by suggesting that the 'trend' for restructuring urban space in aimed at making the latter respond to the 'free market and foreign friendly urban planning.'\(^{14}\)

In the case of changes happening in Kolkata, Partha Chateerjee contends that 'the atmosphere produced by economic liberalisation' has essentially driven the

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restructuration process.\textsuperscript{15} He, however, views Kolkata’s present day changes as belonging to the deeper quest to establish the latter as a ‘post industrial city’. Accordingly, for him, ‘while the new metropolis is globally connected, it is frequently locally disconnected from large sections of its population who are functionally unnecessary and are often seen to be socially or politically disruptive’.\textsuperscript{16}

For Mumbai, Swapna Banejee-Guha argues that the ‘crisis of urban space’, amidst the high velocity of its transformation, springs from the ‘limitations’ from its uneven linkages to the ‘global network’.\textsuperscript{17}

The process of urban restructuring is also highlighted in the context of the framing of environmentalism in cities. Amita Baviskar and Usha Ramanathan argue that cities are being transformed in the name of ‘environmental activism’. Baviskar explores such change as emanating from ‘bourgeois environmentalism’.\textsuperscript{18} According to Baviskar,

‘...for the bourgeois environmentalist, the ugliness of production must be removed from the city. Smokestack industries, effluent producing manufacturing units and other aesthetically unpleasant sites that make the city a place of work for millions, should be discreetly tucked away out of sight, polluting some remote rural-wasteland. So must workers who labour in these industries be banished out of site. Even people whose services are indispensable for the affluent to live comfortable lives – domestic workers, vendors and sundry service providers should live their homes do not offend the eyes, ears and noses of well-to-do’.\textsuperscript{19}

\begin{itemize}
\item \textsuperscript{15} Partha Chatterjee. 2003. Are Indian Cities Becoming Bourgeois at last?. In \textit{Body City- Sitting Contemporary Culture in India}, Edited by Chanderasekhar Indira and Seel Peter C. Delhi: Tulika Books. 181.
\item \textsuperscript{16} Ibid.
\item \textsuperscript{18} Amita Baviskar. 2002. The Politics of the City. \textit{Seminar} 516, August: 41.
\item \textsuperscript{19} Ibid.
\end{itemize}
In a similar vein, Ramanathan typifies slum demolitions in Delhi as being synonymous with ‘clearing spaces’, ‘cleaning up cities’ and ‘beautification’ as being directly linked to the creation of new spaces for the ‘rising culture of malls and parking lots’.

However, the seizure of land and the dispossession of slum residents in the name of bourgeois environmentalism and in deference to the neo liberal aesthetic are pushed by new and different political strategies. According to Geeta Dewan Verma, a professional urban planner, Delhi’s urban poor are technically protected and secured within the rules and norms written into the Master Plan. Nevertheless, as she points out, these ‘entitlements are being consistently denied and downsized by all who are in charge’.

That is, the lack of political will rather than legal clarity enables the violent and forcible eviction of slum residents in Delhi. A clear indication that urban restructuring is carried out as political action rather than simple economic or legal imperative. A claim that is also seconded by Dunu Roy, who has consistently maintained that city planning leading to urban restructuring, has been hostage to powerful interests.

But in contrast to the above overtly political explanations for urban restructuring, studies have also sought to explain change as being driven by economic opportunities. In a largely empirical tone, Amitabh Kundu argues that since 1990 strong urbanisation tendencies have been experienced in regions that have witnessed economic growth. For him, data shows that large cities which have been able to secure high credit rating and raise resources through bonds and other innovative

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credit instruments have also ended up redirecting resources towards further urban restructuring. Thus, Kundu argues that the process of urbanisation has become exclusionary in nature, with investments in infrastructure and basic amenities being drawn towards the big cities while there is a corresponding decline in smaller towns over the years. The Big cities that have been fattened by new financial opportunities have, therefore, been in the forefront of initiatives for dramatic urban restructuring projects.²³

Partha Chatterjee and Leela Fernandes, on the other hand, conceptualise the phenomenon of urban restructuring as being driven intensely by the changing social characteristics of the city. Chatterjee argues that a social divergence has essentially split the city into two. One part can be considered as comprising citizens (civil society) and the other are those who belong to the category of population (political society). The citizenship of the population in the city remains adhoc, as they are treated as not having any legitimate right to stay in the city. They are considered to be encroachers. On the other hand, the citizen (civil society) carries the moral connotation of sharing in the sovereignty of the state and hence claiming rights.²⁴ According to Chatterjee,

'...after a change in government policies towards the city in 1990s, there has been, without doubt, a surge in the activities and visibility of civil society. Organised civic groups have come forward to demand from the administration and the judiciary that laws and regulation for the proper use of land, public spaces and thorough fares be formulated and strictly adhered to, in order to improve the quality of life of citizens. Everywhere the dominant cries seems to be to rid the city of encroachers and polluters and as it was, to give the city back to its proper citizens'.²⁵


²⁵ Ibid. 178.
He further elaborates, that after 1990 a managerial and technocratic elite and a new class of very highly paid workers professional, middle and lower level managers, brokers and middlemen of all kinds have emerged in the city. On the other hand, the new economy would also need low wage workers (political society) but they will probably commute long distances without the protection of the old development state.26 Thus, for Chaterjee, urban restructuring programmes play out the tensions between the cultures and work routines of the citizens as against the populations of the political society.

According to Fernandes, urban restructuring preceded the economic liberalisation in 1990s by first producing a ‘purified middle class culture’ that could inhabit and represent the globalising Indian nation.27 This cultural production of a new middle class, for her, led to the creation of specific forms of material-spatial exclusion for segments of the working class and urban poor. She terms this process as reflecting the ‘politics of exclusion’; that is enforced by a politics of forgetting which then enables the construction of forms of consumer-citizenship.28 Put differently, the consuming middle classes push for the city to be transformed in their image and for their requirements.

The above brief discussion of some works on the subject of contemporary urban restructuring in India indicates that the field has spanned a wide theoretical spectrum. From emphasising the political nature of urban change to explanations that challenge conventions on the understanding of urban citizenship. However, for the

26 Ibid. 182.


28 Ibid. 2425.
purposes of my thesis, two aspects of the above survey need to be highlighted. Firstly, the issue of urban transport thus far has not received any credible academic treatment. Secondly, in failing to situate urban mobility as a critical aspect of political economy, the above studies, I argue, have left incomplete their analysis of the dynamics of neoliberalism that have pushed for urban restructuring between 1990 and 2006. A similar lack of perspective is visible in the studies of several urban transport planners, who, as I will point out, have tried to suggest that urban mobility is primarily a technical challenge.

**Techno-planning Orientation of Urban Transport: Indian Perspective**

As discussed above, most of the studies on urban restructuring in India have largely ignored the latter's relationships to urban transport. The reverse also holds, in most studies on urban transport in India, few, if any, connections, are observed between mobility and the politics of urban change. Much of the urban transport literature, in fact, as will be discussed, continues to focus on the technical aspects of transport and in particular the emphasis has been on examining public transport.

Mobility in most Indian cities, for long, was primarily dependent upon public transport, based on city bus services. It is estimated that buses comprise more than 90 per cent of public transport in Indian cities.\(^29\) Even in big cities such as Mumbai, Kolkata and Chennai which have fairly developed sub-urban rail services, buses still

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account for most public transport services. In fact, buses are the chief mode of public transport in most Indian cities that have less than 50 lakh population. ³⁰

Indian cities are characterised generally by higher population density and greater compactness (smaller area) than cities of the western developed world. Therefore, some argue, these types of spatial organisations are more suited for mass transport facilities. The public bus, in effect, as it is widely accepted, consumes less space per passenger and leads to lower congestion.³¹ City bus services are mostly run by publicly owned State Road Transport Undertakings (SRTUs), while private bus services with a substantial fleet do operate mainly in Delhi and Kolkata.³² Over the years, however, several factors have acted to undermine the viability and functioning of the SRTUs. Allegedly, inefficiency, lack of productivity, excessively high operating costs, and large subsidy requirements have been the lead causes that afflict the functioning of the SRTUs. Since the mid 1990s, it has been plainly stated that the operating deficit along with an overall loss of these state bus services have been rising rapidly. Delhi Transport Corporation (DTC), for example, had been singled out for being the highest loss making SRTU.³³

In order to overcome the problems of the city bus services, as noted above, scholars like S. K. Singh (2005), John Pucher et al (2004), Shailly Arora (2004) and

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³⁰ Ibid. 7.


Nand Dhameja (2001) have suggested that these services be privatised. The arguments run as follows:

a) On the basis of deteriorating financial state of the DTC (New Delhi), it is proposed that the bus service should be fully corporatised, with three or four private operators being allowed to operate buses on city routes.34

b) Similarly, a comprehensive restructuring of the public transport system in Indian cities needs to be carried out.35 Whilst plugging for privatization, it is also argued that such moves must be accompanied by strict regulations, performance standards, and overall coordination to ensure an integrated network of services'.36

However, in contrast to these advocates for the privatisation of the city bus service, R. Sarkar argues that while the private sector might mitigate somewhat the excess-demand for bus transport, it could breed other complications such as 'undisciplined driving, safety violations, a fight over lucrative routes and performance for peak hour operations.'37 Another important issue that is reflected in some recent studies on urban transport in India is over the concern of the phenomenal growth of private cars and two-wheelers in the cities. The total numbers of cars and two wheelers have increased roughly four times faster than the number of buses over recent decades.38 On the reasons for this dramatic shift to private vehicles, however,

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these studies have tended to provide weak analyses. One of them, for example, is that 'dissatisfied' public transport passengers have sought to resolve their mobility challenges by turning to cars and two-wheelers. In effect, a choice brought about by change in sentiment rather than a structural transformation of the city in favour of the car. A second, more rigorously thought perhaps, is the correlation made by Sidhartha Mitra between the mushrooming of private vehicles in India and rapid economic growth and an expansion of the middle class. Whilst, on the surface, such a claim may appear to hold, Mitra’s analyses does not discuss the nature of the economic growth or the changes in the middle class that then causes them to seek the private car as a resolution to their transport requirements. In other words, it is assumed that economic growth and a rise in the middle class per se automatically leads to the quest for privatised mobility.

The tendency amongst most urban transport planners and studies, therefore, to shy away from analysing the nature of the shift to privatised mobility probably explains their overt emphasis on adopting a problem-solving approach. That is, the literature generated in transport studies has not only been overwhelmingly technical but has been largely committed to staying away from questions of political economy. Thus, a slew of works have been aimed at solving the problem of privatised mobility through a change in rules, norms, policies or procedures rather than advocating political interventions. Typically in the style of suggestion technical solutions, for example, one can view the studies by Sanjay Mishra (2000) and Siddhartha Mitra (2006), who advocate for disincentives to discourage private cars and two wheelers; such as cordon/congestion prices for parking. For them, a congestion price should be charged from cars and two wheelers upon their entry into central business districts

Parking prices, accordingly, should also be increased in CBDs and institutional areas. These disincentives, furthermore, according to them, should be complemented by other government initiatives such as fixing an annual ceiling on the number of new registration certificates to be issued for cars and two-wheelers. And any vehicle not so registered would be required to pay an extra toll or fee upon entering the municipal limits.40 Clearly, both Mishra and Mitra pose the problem as one involving market pricing rather than linking the explosion in cars to processes of political economy or to deeper structural changes brought about by neo-liberal interventions.

Urban transport in India has also been debated as challenges involving efficient traffic management, improving road infrastructure, linking urban transport with economic development, effective implementation of master plans and institutional reform.41 While discussing the traffic scenario in metropolitan city centre (MCC), D. Sanyal proposes the following measures to overcome the problem: segregation of destined and through traffic; augmentation of road and parking capacities; introduction of new/additional transportation system (MRTS); non transportation options like shifting of activities outside the MCC area, demand measurement measures like congestion pricing.42 In the context of transport management in Chandani Chowk (commercial centre in old Delhi), A. K. Sharma et al., argue that the conventional transport system management strategies like supply


augmentation, restraint management and demand reduction need to be considered in addendum to the most mobile, low cost option of activity rescheduling. By activity rescheduling they mean staggering the activities over the days of the week. For example an off day for each activity is staggered or rescheduled. The idea is to shift the demand so as to make more efficient use of transportation resources.43

Vinod Sibal is of the opinion that the high congestion levels on roads, declining journey speeds, high energy consumption and increased vehicular emissions and accidents are all due to insufficient road infrastructure facilities and inadequate regulation.44 Sibal, therefore, suggests the following steps:45

- Plan land use integrated with transport.
- Strengthen road infrastructure.
- Implement TSM measures.
- Develop and encourage new fuel efficient vehicle technologies and environment friendly alternative fuel.
- Set up/strengthen institutional arrangements.

Kaushik Deb and Ankush Malhotra argue the goal of sustaining mobility must be linked with the goal of fostering economic development, improving the environment, reducing energy consumption, promoting transportation friendly development patterns, and encouraging fair equitable access to residents of different


socio-economic groups.\textsuperscript{46} In Sudhakar Yedla’s view addressing the issue of urban transportation is a complex exercise and any effort to achieve sustainable transportation needs to go by a holistic view of diverse aspects of travel demand, vehicular growth pattern, emissions, auto technologies, traffic management, and efficient land use pattern and auto fuel quality on the one hand, and the absorptive capacity and acceptability on the other.\textsuperscript{47}

Carrying further the argument in a similar tone, S.K. Kulshrestha suggests that there are planning related solutions provided in different Master Plans that need to be effectively implemented. He suggests that, despite limitations, rational land use planning of cities can be a potent tool for both spatio-economic development and environmental management. Thus, for him, the introduction of a mass-transportation system in mega and metro cities alongside its integration with major activity nodes such as industrial and commercial areas, can help shape a positive urban environment.\textsuperscript{48} In a similar vein N. Ranganathan suggests that the emphasis in addressing the urban crisis of mobility and infrastructure lies in organisational reform and restructuring of administrative capacities at various levels of government.\textsuperscript{49}

Pedestrian and non-motorised vehicles have been another important arena for research in urban transport studies in India. In particular, one refers to the publications by Dinesh Mohan, Geetam Tiwari, and Michael Replogle. The crux of


their claims has been concentrated on finding means to address the needs of ‘non-motorised modes of traffic’. According to Mohan and Tiwari, pedestrians, bicyclists and non-motorised rickshaws make up a considerable portion of the traffic in cities. However, despite their numbers this substantial element remains unplanned for and unaccounted for in most transport policies in Indian cities. In fact, they argue that if the infrastructure design does not meet the requirements of these elements all modes of transport will inevitably be forced to operate in sub-optimal conditions.\textsuperscript{50} Replogle similarly chimes in by claiming that transport planning and investment in much of Asia has focused principally on the motorised transport sector and has often ignored the needs of non motorised transport. Unless non-motorised transport strategies are adopted to slow or reverse these trends, according to him, problems related to traffic safety, air pollution, energy use, traffic congestion, urban sprawl and the employment and mobility of low income group people may spiral out of control. Not to mention the fact that higher hydro-carbon consumption could aggravate climate change.\textsuperscript{51}

In New Delhi especially, apart from bicycles, non-motorised rickshaws are used for delivery of goods like furniture, refrigerators, washing machine etc. Semi skilled workers, carpenters, masons, plumbers, postmen, and courier services continue to rely on bicycles. The demand, therefore, for bicycles and rickshaws remains substantial. Similar is the case with the number of persons who continue to essentially walk to work or have long walking trips before they can access buses. Mohan and Tiwari, have pointed out that the ratio of fatalities to the proportion of trips is the highest for bicycle commuters and pedestrians, in comparison to motorised


vehicles. In fact, they argue, that the construction of the metro rail system and an increase in the number of buses would paradoxically give a fillip to the number of access trips by walking and bicycling. High-density metro rail corridors increase the presence of pedestrian on the surface. Thus, special measures are called for traffic calming, speed reduction, and the provisioning of better facilities for bicycles and pedestrians. In doing so, not only, according to them, can the safety of passengers be ensured but also the speed of the traffic can be sustained, if not increased.52

There have also been case specific studies on urban transportation in India. For example, the controversial government initiative to compel all public transport vehicles to run on Compressed Natural Gas (CNG) engines in Delhi. The consequences that followed the forced adoption of CNG were mostly debated in two distinct frames. One set of scholars such as Dinesh Mohan (2001) and Vinish Kathuria (2005) argued the case purely on technical grounds, whereas Kuldeep Mathur (2003) examined it as a judicial and political challenge. According to Mohan, the conversion of all public transport into CNG would cause its operation costs to rise and accordingly any technology which increases the price of public transport would also result in the increase in the use of two-wheelers and cars.53 He substantiates the argument by stating that if the cost of travel in public bus is equal to the cost of travel by two-wheelers, commuters would certainly shift to two-wheelers. His second point is that one cannot replace the whole transport system into a new technology in one go. Usually replacements are made at rates of 5 to 10 per cent a year because new technologies and systems need to be tested and set up gradually. His third point is that the engine proposed for the conversion of public buses is an obsolete technology. It is


no longer used in West European countries or the USA. He further argues that the size of particles omitted by diesel engine is 10 micron whereas the size of particles omitted by a fuel like CNG is 2 micron. Because of their smaller size these particles go much deeper into the lungs and have the potential of causing even greater damage than the particles omitted by diesel. \(^{54}\) Mohan concludes by stating ‘it’s very dangerous to base an entire fleet on a new technology with which we do not have sufficient experience’. \(^{55}\)

While investigating whether CNG conversion has affected the pollution profile in Delhi, Kathuria concluded that the results did not indicate an all-round improvement in ambient air quality. Rather, on closer examination, Kathuria pointed out that NOx had risen after the conversion, whereas SPM and PM had shown only a marginal fall. Only, in his opinion, there was some decline in CO. Thus, the CNG conversion did not warrant a clean chit with regard to clearing the air quality in Delhi. \(^{56}\) For Mathur, on the other hand, it was striking that the CNG decision was not resolved essentially as a technical issue by the Supreme Court of India. Rather, the Court’s decision was a choice of a ‘world view’ rather than one involving an interpretation of law. \(^{57}\) In effect, Mathur highlights how, on the one hand, significant tension exists between technology and politics, while, on the other hand, they are also mutually shaped. Thus, the Court’s revealed a bias for CNG rather than having a considered technically informed opinion.

\(^{54}\) Ibid. 62-63.

\(^{55}\) Ibid. 63.


As far as the metro rail in Delhi is concerned, there have been limited critical explorations on the project. One being by Dinesh Mohan (2002), who questioned the government’s claim that congestion and pollution in Delhi could be controlled following the introduction of the metro rail. In his opinion, the metro was actually aimed at clearing the roads for cars by moving the urban poor to accepting the metro as their most viable means for possible transport. Hence, for Mohan, the metro would by helping increase the number of private vehicles on the road would end up aggravating pollution. In a similar vein, he argues that metro would also end up fuelling a real estate boom as the Delhi Metro Rail Corporation (DMRC) intends to encourage commercial establishments in and around metro stations.58

Matti Siemiatycki (2006) asserts that when viewed within the broader trajectory of infrastructure mega project development, the Delhi Metro experience suggests that mega projects are seductive for their potential to reorder space and culture; the direction of which is increasingly guided by international meanings and aspirations. Intriguingly, while metro railways in other cities around the world have had their official mythical representations challenged by ‘competing and insurgent visions’, the imagery of the Delhi Metro as an apolitical artifact has gone largely uncontested.59 However, this is not to imply that an overtly technical reading of urban transportation has been simply a homogenous. Rather, as we will explore below, overtly technical perspectives on urban transport have been fairly diverse and often times factor in social explorations as well. Nevertheless, as I will also hope to show, despite variations in such narratives the framing of urban transport has remained shy of drawing sharp relationships between mobility and capitalism.


Techno-planning Orientation of Urban Transport: International Perspective

As pointed out above, studies on urban transport in India (keeping New Delhi particularly in mind) have tended to be largely committed to an overtly technical or engineering reading of the subject. However, the overtly technical narratives have also displayed a wide variety in perspective; whereby studies despite touching upon social implications have nevertheless inserted the latter into problem solving or policy frameworks rather than setting the latter as challenges for political resolution or power. In this section, therefore, I will explore the manner in which urban transport as principally being a technical project has been articulated in a variety of studies.

Julian Heine and Fiona Mitchell, in their work, discuss the issue of social exclusion as a consequence of bad transport planning. For them, transport exclusion results from a collection of factors such as physical, temporal, economic, spatial and psychological. Through a qualitative analysis of data they illustrate these dimensions of exclusion in the form of inaccessible design of buses, trains and station; location of bus stops and station; the unpredictable long wait for buses or trains; attitude of staff in buses and trains and experiences of travel. They believe that transport disadvantage is clearly experienced by different groups within society and is a social concern that must be righted by policy.

Susan et al., discuss ‘mobility-related exclusion’ and its relationships to poverty. Mobility-related exclusion is the process by which people are prevented

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61 Ibid. 331.
from participating in the economic, political and social life of the community because of reduced accessibility to opportunities, services and social networks, due in whole or in part to insufficient mobility in a society and environment built around the assumption of high mobility.\textsuperscript{62} For them, such mobility related problems can be overcome through ‘virtual mobility’. Virtual mobility is a shorthand term for the process of accessing activities that traditionally require physical mobility, but which can now be undertaken without recourse to physical travel by the individual undertaking the activity. For example working outside of the office (teleworking); conducting business online; creating new and maintaining old social networks online via email and personal webpages; accessing health care and advice; formal and informal education; and shopping for goods online.\textsuperscript{63}

The challenge of linking transport and sustainability has also been part of the technical spectrum. David L. Greene and Micheal Wegener focus on the issue of environmental sustainability and transportation.\textsuperscript{64} Greene and Wegener argue that the current trends in transport are not sustainable. They discuss the most important environmental impacts of transport and show that there is still a range of speculation about severity of their long term consequences, the actual limits of finite resources and the prospects of the emergence of totally new resources of energy and propulsion.\textsuperscript{65} In their opinion, the negative externalities of transport have a social or equity dimension, as those who cause them and those who are affected are unevenly


\textsuperscript{63} Ibid. 213.


\textsuperscript{65} Ibid.
distributed across socioeconomic groups within one country and across countries.\textsuperscript{66} This will demand fundamental changes in the technology, design, operation, and financing of transport system. They discuss the most important policy approaches currently applied or applicable in the future and classify them as technology-oriented, supply oriented and demand oriented.\textsuperscript{67}

According to William Black, there are five dimensions for developing a sustainable transport perspective. These five dimensions are petrol as a finite resource, atmospheric pollution, congestion accidents and fatalities and use of land.\textsuperscript{68} He argues that all the above five challenges can be resolved through policy approaches. The problem of finite fuel reserves, for example, can be solved by alternative fuel/alternative vehicles. Atmospheric pollution, on the other hand, can be reduced by introducing electric vehicles and alternative fuel. Congestion on the roads can be reduced through transport demand management techniques (e.g ordinances, carpools, vanpools, parking regulation, and so forth). And finally, fatalities and injuries can be reduced by systematically using the accessories available in the today’s car.\textsuperscript{69}

Hogo Priemus et al. have tried to establish the relationship between transport and land use. They argue that spatial dynamics influence mobility, and mobility leads to the shaping of certain form of spatial dynamics. While discussing how spatial dynamic influence mobility they conclude that a compactly built city presents a good

\textsuperscript{66} Ibid. 180-181.

\textsuperscript{67} Ibid. 181-182.


\textsuperscript{69} Ibid. 143-146.
condition for a modal split — with a high share for public transport and a low share for car traffic. However, the more compact a city becomes, the greater the level of suburbanisation involving a high demand for housing and industry and resulting in the increase in land prices and real estate.\textsuperscript{70} That is, when a parcel of land becomes accessible through proximity to a motorway or a high quality public transport connection, the land value of this parcel increases. The land parcel thereby becomes more attractive as a location for housing estates and/or offices. This attraction explains the rapid development of industrial estates along the motorways.\textsuperscript{71}

Frans M Dieleman et al discuss transport as being substantially shaped and influenced by human behaviour. They argue that apart from urban form and design, influence of personal characteristic and attributes of the residential environment have an impact on modal choice (private car, public transport, cycling, walking, etc.) and distance travelled. People with higher income are more likely to own and use a private car than low income households. Families with children use cars more often than one person households. The purpose of a trip — work, shopping, and leisure — also influence travel mode and distance.\textsuperscript{72}

In a similar vein of reasoning, Nigel Taylor describes the experience of road traffic in contemporary cities as a salient aspect of aesthetic judgement. In his opinion people's aesthetic experiences of road traffic may vary among different groups that are differently situated. He argues that there are some people who find the

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\footnote{\textsuperscript{70} Hogo Priemus et al. 2001. Mobility and Spatial Dynamics: An Uneasy Relationship. \textit{Journal of Transport Geography} 9: 168.}
\footnote{\textsuperscript{71} Ibid. 169-170.}
\end{footnotes}
phenomenon of moving traffic in the modern city, and their participation in it, one of
the things which makes city lively, stimulating, exciting. Because of the sheer
quantity of road traffic on our streets, and because this traffic command our attention,
most people's aesthetic experience as they move about the city is dominated by their
experience of road traffic. Though many may also find the sensory and cognitive
invasiveness of traffic in modern city aesthetically unpleasant and often oppressive.
In sum, the aesthetic experience of traffic can and does often become a significant site
for contests over how urban transport is designed and coordinated.

Several studies also examine contemporary dilemmas of urban transport as
being challenges that are produced by policy effects. Alan Hallsworth et al argue that
government policy-making, be it macro-scale or related to specific, relatively minor,
initiatives has rarely escaped the clutches of 'uncomfortable consequence'. By
uncomfortable consequence they mean 'policy driven outcome that was not foreseen
at all'. They further argue that we are edging in the direction of claiming that most
transport related policies are so flawed as to be consistently 'counter-productive'. By
giving various examples they show that government policies – often driven by
'shortermism – seem to throw up perverse outcomes with startling regularity'. In their
opinion a more balanced holistic and long term perspective that seeks to anticipate
any behavioural responses can be beneficial.

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74 Ibid. 1623-1624.


76 Ibid.
In most of the studies, therefore, it appears that the framework that is invariably advanced is either of the two; problem solving or the solutions seeking approach. Despite their complex treatment of the subject, these studies appear to attempt to situate urban transport as being outside processes of political economy. Thus, urban transport has been overwhelmingly framed as planning, engineering and regulatory problems. In other words, urban transport can always be handled through innovative technical solutions.

Undoubtedly, many insights can be gained from the planning and engineering view, especially with regard to how technological choices can bring about certain transport competencies, efficiencies and possibilities for shaping mass transit in cities. These frameworks overwhelmingly tend to emphasise the need for 'correct' and 'efficient' norms, rules, laws and regulations, which are then expected to be bureaucratically enforced and subject to review and control by experts and expertise. For the protagonists of the planning and engineering model, transport failure or success is the cause and effect of 'bad' technological choices or 'incompetent' decisions by relevant administrative authorities. That is, the impetus for transport change is not viewed as a political process but instead discussed as a linear unfolding in scales of technological adoption or as responses to problem solving or for contending with unanticipated social and environmental outcomes from transport choices.

These frameworks and their analyses, however, by restricting the issue of transport as one of technique and technological capacity, invariably overlook the complex social and political interactions that shape, influence and galvanise transport choices. In other words, I argue, in contrast to the planning and engineering advocates, that Delhi's transport-revolution (1990-2006) will be inadequately
understood if viewed only from the vantage of the linear development of technology and the play of institutional arrangements. Rather, when located in the overall context of the dramatic transformation of Delhi as a city in terms of its economic, political, physical and social worlds between 1990 and 2006, the transport revolution drew largely from such forces. That is, transportation in Delhi was as much shaped by technological choices as those choices were influenced and configured by political, economic, physical and social processes, that in the main had been unleashed and accelerated by the City's embrace of neo-liberal capitalist restructuring.

Situating Urban Transport in Capitalism

This section attempts to conceptualise urban transport as being implicated in larger process of political economy. Central to such a quest, however, is the need to relate debates on urbanisation to capitalism. Henri Lefebvre (1974), David Harvey (1985, 1989, 2001, 2004), Neil Smith (1984, 1996), Manuel Castells (1977, 1996), Saskia Sassen (1994) and others have contributed immensely towards situating urbanisation within the dynamics of capitalism.

In Harvey's opinion, Marx's theory of accumulation has tended to ignore the spatial dimension, which is central to the capitalist mode of production. According to Harvey, capitalism's 'dynamic and inevitably expansionary' nature compels it to constantly attempt to penetrate into new spheres of activity (transformation of peasant subsistence agriculture into corporate farming), creating new social wants and

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needs, developing entirely new product lines (automobiles and electronic goods) and
organising consumption, facilitating and encouraging expansion of population (from
the standpoint of expanding the labour power and market for products), and
expanding geographically into new regions (for increasing foreign trade, exporting
capital and in general expanding towards the creation of ‘world market’).\textsuperscript{78}

The first three items can be viewed as a matter of ‘intensification’ of social
activity, of markets, of people within a particular spatial structure. The last item
concerns itself with the question of spatial organisation and ‘geographical
expansion’.\textsuperscript{79} The geographical expansion entailed in capitalism for increasing
effective demand is in other words a process of ‘production of space’ in order to
widen the sphere of circulation. If the sphere of circulation does not expand then
accumulation comes to a halt. Harvey hence signalled the importance of the notion of
space to capital. A relationship that had in fact earlier been theorised by Henri
Lefebvre (1974) with the notion of the ‘production of space’. According to Lefebvre,
‘social space is a social product’.\textsuperscript{80} Wherein the process of production of space takes
place at three interrelated levels: ‘biological reproduction, reproduction of labour
power and the reproduction of social relations of production’\textsuperscript{81}, through which
emerges a conceptual triad of ‘spatial practice, representations of space and
representational spaces’.\textsuperscript{82} Spatial practice embodies a close association, within
perceived space, between daily reality (daily routine) and urban reality (the routes and

\textsuperscript{78} Ibid. 241-242.
\textsuperscript{79} Ibid. 242.
\textsuperscript{81} Ibid. 32.
\textsuperscript{82} Ibid. 33.
networks which link up the spaces set aside for work, 'private' life and leisure). Representations of space is conceptualised space, the space of scientist, planners, urbanist, technocratic and others – all of whom identify what is lived and what is perceived with what is conceived. This is the dominant space in any society (or mode of production). Representational spaces are spaces as directly lived through its associated images and symbols, and hence the space of 'inhabitant' and 'users' but also some artists and perhaps of those, such as few writers and philosophers who describe and aspire to do more than describe. Lefebvre opines that there is a dialectical relationship between the conceptual triad. 83

Harvey draws his conception of spatial practice from Lefebvre's conceptual triad of spatial practice, representation of space and representational spaces. He lists four other aspects to spatial practice – 'accessibility and distanciation, appropriation and use of space, domination and control of space and production of space'. 84 In his opinion these four dimensions to spatial practice are related to each other. According to Harvey,

'...the friction of distance is implicit in any understanding of the domination and appropriation of space, while the persistent appropriation of space by particular group amounts to a domination of that space. The production of space, insofar as it reduces the friction of distance alters distanciation and the conditions of appropriation and domination'. 85

In Harvey's opinion agglomeration and concentration of production, circulation, exchange and consumption within a typical physical landscape can be defined as urban space. In his different texts, Harvey, refers to urban space as 'spatial

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83 Ibid. 38-39.


85 Ibid. 222.
organisation’, ‘built environment’, ‘structured coherence’ and so on. Urban spaces are, in effect, the workshop of capitalist production. The annihilation of space by time is here accomplished by a rational location of activities with respect to each other so as to minimise the costs of movement of intermediate products in particular. Along with this concentration of men and capital thus accelerated at certain point, there is concentration of these masses of capital in the hands of few.86

Harvey further elaborates that urban space is a complex composite commodity comprising innumerable different elements – roads, canals, docks and harbour, factories warehouses, sewer, public offices, schools and hospitals, houses offices, shops etc. – each of which is produced under different conditions and according to different rules. A proportion of this built space will be used in common by capitalist and consumers, and even those elements that can be privately appropriated (houses, factories, shops, etc.) are used in a context in which they drive accumulation.87

According to Manuel Castells, however, there can be no emphasis on a specific theory of space, but there exist a theory of ‘social structure’. He argues that any concrete society and any social form may be understood in terms of several modes of production. By modes of production he means the particular matrix of combinations of fundamental instances (systems of practices) of social structure: essentially the economic, politico-institutional and the ideological.88 According to Castells,


'...to analyse space as an expression of social structure amounts, therefore, to studying its shaping by elements of economic system, the political system and the ideological system, and by their combinations and the social practices that derive from them'.

Neil Smith as well reasserts this 'unity between space and society' and it is this which governs the production of space (notion borrowed from Lefebvre). In Smith’s opinion,

Production of space is not only the direct physical production of space, but also the production of meaning, concepts and consciousness of space, which are inseparably linked to its physical production.

Smith argues that capitalism produces specific absolute space, the most obvious case where geographical space functions as a means of production is in the transportation industry. Here the distance between origin and destination is a means of production. The greater the development of means of transportation and communication, the more geographical space is drawn into economy as a means of production.

With the development of capitalist mode of production based on commodity exchange, relative space emerges and with the emergence of relative space, the conceptual separation of society and space emerges. He believes that 'the more society emancipates itself from space in this fashion, the more space can be transformed into a commodity'. There are contradictory tendencies toward differentiation and equalisation, which determine the capitalist production of space.

89 Ibid. 126.
91 Ibid.
92 Ibid.
93 Ibid. 80.
As a result 'space is neither levelled out of existence nor infinitely differentiated. Rather the pattern which results is one of uneven development'. 94

The dialectic of geographical differentiation and equalisation operates at the level of various scales. Three primary scales emerge in this process – 'urban space, scale of nation-state and global scale'. 95 Smith is of the opinion that 'the centralisation of capital finds its most accomplished geographical expression in urban space'. 96 With the development of the capitalist city there is a systematic differentiation between the place of work and place of residence, between the space of production and the space of reproduction. In order to sustain the process of accumulation, capitalism always tries to improve its forces of production (labour, division of labour, technology and knowledge). For the fast accumulation of capital there is a need of fast circulation of capital. In capitalism the circulation of capital is primarily based on huge networks of communication and transportation. Eventually transportation becomes an instrument through which circulation of capital could be fastened onto. 97

Harvey borrows the term 'annihilation of space by time' from Marx. He argues that the aim and objective of those engaged in the circulation of capital is to command surplus labour time and convert it into profit, within the socially-necessary turnover time. 98 The turnover time of a given amount of capital is equal to the

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94 Ibid. 90.
95 Ibid. 135.
96 Ibid. 136.
97 Ibid. 136-139.
production time plus the circulation time. The longer the turnover time of a given capital, the smaller is its annual yield of surplus value. However the geographical expansion or widening of the sphere of circulation causes increase in turnover time of capital unless there are compensating improvements in the speed of circulation. Any reduction in circulation time, therefore, increases surplus production and enhances the accumulation process.\textsuperscript{99}

Circulation of capital can be viewed as a continuous process in which money is used to buy commodities (labour power and means of production such as raw material, machinery inputs, and the like) for the purpose of combining them in production to make a fresh commodity that can be sold for the initial money outlay plus profit. Survival of capitalism is predicated on the continuing vitality of this form of circulation. If profit can no longer be had, then ostensibly the reproduction of daily life would also dissolve into chaos.\textsuperscript{100} With respect to the movement of commodities, capitalism not only seeks to overcome spatial barriers, it aims to do so at the most minimum time and cost. Investment in new systems of transport and communication reduce spatial barriers and roll back the possible geographical boundaries of exchange relation.\textsuperscript{101} In other words, it seeks to annihilate space by time through effective transportation and communication networks.

The cost of transportation is also important in so far as the expansion of market and the exchangeability of the product are connected with it. The costs of

\textsuperscript{99} Ibid. 244.
\textsuperscript{101} Ibid. 186.
circulation can be reduced by improved, cheaper and more rapid transportation. Placed in the context of accumulation in general, improvement in transport and communication are seen to be inevitable and necessary. That is, the revolution in modern capitalist industry and agriculture made necessary a revolution in the means of transport and communication thorough the deployment of river steamers, railways, ocean steamers and telegraphs.\textsuperscript{102}

However, crucial to this mobility is the manner in which it shapes labour markets that are perpetually in the course of modification. Vast capital investments, for example, are directed to achieve even relatively minor increases in the range for daily commuting. In-migration and population growth, similarly, are crucial elements to augmenting the supply of labour power and also entail considerable and sometime vast capital investments for housing, food and care, besides arranging for mass mobility.\textsuperscript{103}

Harvey innovatively ties together such processes of geographical expansion, the circulation of capital and the crises of accumulation with the notion of the 'spatio-temporal fix'.\textsuperscript{104} In a somewhat long drawn out explanation, Harvey observes that some types of capital necessarily circulates at a much slower pace — such as fixed capital (machinery, physical plant, transportation and other infrastructures) and within the consumption fund (consumer durables, housing and so on), the production of science and technology, social infrastructures of health, education and social services, judiciary, state administration, law enforcement and military protection define areas —


\textsuperscript{103} Ibid.

\textsuperscript{104} Ibid.
in which gestation time of projects is typically long and the return of benefits spread over many years.\textsuperscript{105} Thus, the built environment such as urban infrastructure investments are capable of absorbing massive amounts of capital and labour particularly under conditions of rapid geographical expansion and intensification.\textsuperscript{106} Though such reallocation of capital and labour surpluses requires the mediating help of financial and/or state institutions, it does help to stabilise the circulation process into an annualised rate of return.\textsuperscript{107} That is, it helps soak excess surplus capital and labour and thereby prevents an over accumulation crises.

The spatio temporal fix is, however, not a contradiction-free process. By stretching out the tendency to overaccumulate far into the future, crises can perhaps be staved off for many years. But the longer the crises are staved off, the greater the quantity of fictitious capital, the more overaccumulation problem itself accumulates in pent-up form, and the deeper the ultimate crises.\textsuperscript{108} The spatio-temporal fix is thus a concept that is aimed at explaining how capitalism attempts to solve its crises of accumulation through ‘temporal deferment and geographical expansion’. That is, the production of space, the organisation of wholly new territorial divisions of labour, the opening up of new and cheaper resource complexes, of new dynamic spaces for capital accumulation, and the penetration of pre-existing social formations by capitalist social relations and institutional arrangements (such as rules of contract and

\textsuperscript{105} Ibid. 319.
\textsuperscript{106} Ibid.
\textsuperscript{107} Ibid. 320.
\textsuperscript{108} Ibid. 323.
private property arrangements) are repeatedly configured and shuffled to provide ways to absorb existing capital and labour surpluses.\textsuperscript{109}

To roughly sum up, Harvey provides a helpful analytical toolkit to grapple with the issue of contemporary urban transformation both in terms of scale and in terms of the direction of such change. Once thus conceived as a major site for the negotiation of capitalist dynamism, the urban city becomes more than a technical or engineering construction. Rather, under the regime of capital, urban space is constantly produced and reproduced as a site for resolving the crises of accumulation. Consequently, as we have pointed out earlier, understanding Delhi’s transport challenges (especially between 1990-2006) requires a clearer insight into neo-liberalism, both as providing a context for rapid urban change and for the manner in which the accumulation crises is sought to be mediated.

Neo-liberalism has been discussed widely by a range of scholarship. However, a complete review of the term is neither central nor possible in this thesis. We will, therefore, attempt to discuss some of the concepts which have been considered as being critical to an understanding of neo-liberalism. The studies we refer to are by Brenner and Theodore (2002), Peck and Tickell (2002), Dezalay and Garth (2002), Larner (2003), Peet (2003) and Kohl (2006).

Peck and Tickell suggest that neo-liberalism has become a dominant ideological rationalisation for globalisation and the contemporary state ‘reform’. From its initial origins as a utopian intellectual movement, Neo-liberalism was aggressively politicised by Reagan and Thatcher in the 1980s, before acquiring a

more technocratic form in the 1990s as the Washington consensus. Crucially, according to them, neo-liberalism in the main, pushed for the 'virtues' of free trade, flexible labour and individualism. These, furthermore, are complemented by the call for the extension of competitive markets with aggressive forms of state downsizing, austerity financing, and public service 'reform' local functionaries.\textsuperscript{110}

In the context of urbanisation, neo-liberalism has been conceptualised as possessing a transformative capacity aimed at reconfiguring urban spaces into 'world cities' (Friedman and Wolf 1982), 'global cities' (Sassen 1994), 'information city' (Castell 1994), 'gentrification' (Smith 1996) or leading to change through the 'accumulation by dispossession' (Harvey 2004).

According to Friedman and Wolf 'world cities' are spatial articulation through which the world economy is dialectically related to the national economies of the countries in which these cities are situated. World cities in the core and periphery serves as command and control centre for banking and finance, management and ideology.\textsuperscript{111} Sassen argues that 'global cities' are the key sites for finance and specialised service and they serve as transnational marketplaces for the implementation of global economic operations.\textsuperscript{112} Castell is of the opinion that 'Information city' articulates the directional functions of the global economy in a network of decision making and information processing.\textsuperscript{113}

\textsuperscript{110} Jamie Peck and Adam Tickell. 2002. Neoliberalising Space. \textit{Antipode} 34 (3): 381-382


Timberlake, ‘global cities’ are considered as ‘linchpins in the spatial organisation of the world economy’. They serve as the nodes through which capital and information circulate and where headquarters of multinational corporations (MNCs) and finance institutions and their specialised support services are concentrated.\footnote{114}{David A Smith and Michael Timberlake. 1995. Conceptualizing and Mapping the Structure of the World System’s City System. \textit{Urban Studies} 37 (12): 287.}

Smith also argues that a crucial dimension of neo liberal urbanism in the twenty-first century is the ‘uneven inclusion of Asian and Latin American urban experiences’. Added to which is secondary dimension of what might be called the ‘generalisation of gentrification as global urban strategy’.\footnote{115}{Neil Smith. 2002. New Globalism, New Urbanism: Gentrification as Global Urban Strategy. \textit{Antipode} 34 (3): 437.} The generalisation of gentrification has various aspects. These can be understood in terms of five interrelated characteristics: the transformed role of the state, penetration by global finance, changing levels of political opposition, geographical dispersal and the sectoral generalisation of gentrification.\footnote{116}{Ibid. 441.}

Retaking the city for the middle classes involves a lot more than simply providing gentrified housing. According to him,

\begin{quote}
Gentrification has evolved into a vehicle for transforming whole area into new landscape complexes that pioneer a comprehensive class-inflected urban remake. These new landscape complexes now integrate housing with shopping, restaurants, cultural facilities, open space, employment opportunities – whole new complexes of recreation, consumption, production, and pleasure as well as residence. Just as important, gentrification as urban strategy weaves global financial markets together with large and medium sized real estate developers, local merchants, and property agents with brand name retailers, all lubricated by city and local governments for whom beneficial social outcomes are now assumed to derive from market rather then from its regulation. Most crucially, real estate
\end{quote}
development becomes a centerpiece of the city’s productive economy, an end in itself, justified by appeals to jobs, taxes, and tourism. 117

Harvey argues that capitalist accumulation is always in concurrence with dispossession, termed as ‘accumulation by dispossession’. 118 A concept drawn from the notion of ‘primitive accumulation’, in turn, extensively used by Marx in the latter’s various writings. Primitive accumulation refers to processes involved in the direct seizure, often through violence, of the means of production and thereby leads to the transformation of the dispossessed into wage labour or the proletariat. 119

The above writings on neo-liberal urbanisation seem to suggest that urban change, especially in contemporary times, is fundamentally anchored in a new moment of capitalist dynamism. Notably, in the fact, that one is witness to the domination of the high finance in producing the urban city as site that is essentially resolving the challenges of over accumulation through a new type of spatio-temporal fixing. For our purposes, this line of reasoning helps us understand the implications of this type of urban change in terms of its implications for urban transport and communication.

Conclusion

From the discussion above, it can be suggested that Delhi’s transport revolution (1990 to 2006) cannot be solely grasped within the sphere of a planning

117 Ibid. 443.


119 Ibid.
and engineering framework. As noted, the technical view of urban transport often fails to reveal the dynamics that drive transport change nor is it able to relate transformation to issues of political economy. This particular fact, for example, is well borne out upon a review of some of the recent studies on urban restructuring in India. These studies tend to either view transport as a technical problem or entirely ignore the political nature of urban mobility. Hence, these studies have tended to remain ignorant of the central role that transport has played in the unfolding of modern day capitalism. And, not unexpectedly, these studies have by default failed to connect contemporary urban transformation to the larger impacts of neo-liberalism on urban city spaces.

In contrast, I have sought to argue that urban transport offers an important site for the study of the contradictions and complications of capitalist accumulation. In step with the writings of Neil Smith, David Harvey, Henri Lefebvre, Manuel Castell, Saskia Sassen and others, Delhi’s transport revolution suggests an attempt by urban planners and the political process to move the city into a tight embrace with the neo-liberal project of reworking urban space. In the subsequent chapters, I will be outlining in detail the elements that comprise this neo-liberal shift in urban transport; namely commercialising mobility, gentrifying mobility and transforming mobility as choice.