

REMAKE CITY FORM AND FUNCTION: NEO-TRADITIONAL NEIGHBOURHOOD DESIGN APPROACH IN COALITION WITH LAHORE METRO BUS SERVICE

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ABSTRACT

Developing countries are facing various challenges and mass scale urbanisation; and issues related to urban mobility are few of them. Particularly mega cities are struggling with increased rates of motorisation along with dilapidated conditions of public transport systems. To overcome these mobility hurdles the adoption of Bus Rapid Transit (BRT) is considered an optimal option for countries with limited financial and technical resources. Likewise, the policy makers of Pakistan introduced the first BRT named the Lahore Metro Bus (LMB) in 2013. This research examines the role of LMB under the lens of urban planning.

To determine the potentials of BRT (LMB) in terms of urban development this research paper is organised into two sections. In section one the nature of the executed metro bus service in Lahore is explored and in section two the potentials of this service from the perspective of urban planning are discussed. The methodology adopted in this study is a mixed method research structured on an exploratory sequential framework. Semi structured interviews are conducted with planning professionals of Lahore explaining the role that the service has or ought to have in terms of urban development. These interviews with planning professionals highlight certain discourses, explaining the current planning process of transit service and future policy implications.

The study concludes that the metro bus concept is executed as a stand-alone mobility component in Lahore. Therefore, the benefits are limited to move people from one place to another. However, if the metro service were envisioned as a component of urban policy then it could have had a wide potential to impact the urban form of the city. It was further determined that the adapted measures as a part of this concept are narrowly engineering focused towards the technical

aspects of this service, while the socio-cultural components of the city are neglected.

To enhance the benefits of LMB service from the perception of urban planning, the concept of Neo-Traditionalism is suggested in conjunction with the existing transit facility. The application of Neo-Traditional Neighbourhood Design (NTND) approach would be the first step to turn the transit neighbourhoods into Neo-Traditional communities. These communities appear and function like old styled environment friendly towns. A Neo Transit Lahore Model (NTLM) is derived as an outcome of this paper. This model would curtail the negative impacts of urban sprawl by promoting the use of public transport and non-motorised travel in the transit neighbourhoods of Lahore. In this study the contemporary transit infrastructure is used as a tool to revive the conventional features of Lahore. The parameters of this approach are analysed in three selected neighbourhoods along the LMB corridor. The Neo-Traditional transit model approach will have social, economic and environmental implications.

Keywords: New Urbanism, Neo-traditional neighbourhoods, Connection between communities, Lahore Metro Bus Service

INTRODUCTION

Urbanisation is the biggest challenge of this century particularly for countries with limited financial and technical resources (Zhu, 2017). Mega developing cities are experiencing significant urban growth and consequently urban mobility has also increased. Furthermore, urban sprawl burgeons distances between various land uses and to meet higher travel demand citizens either rely on private modes or on public transport systems. In developing countries ownership of private travel modes is limited therefore significant proportion of urban population uses public transport

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to travel (Currie and Delbose, 2011). However, in many developing countries either there is no public transport system at all or it exists in dilapidated conditions. Therefore, the provision of an efficient and affordable public transport system is critical for the urban policy makers (Farrell, 2017).

To deal with mobility challenges the provision of ‘mass transit system’ is considered a panacea in developing countries. Mass transit system is composed of either light rail trains or high capacity buses, carrying large number of passengers to enhance the urban mobility. The concept of Bus Rapid Transit (BRT) is proved as a high-profile public transport mode in this regard. In the last decade the unprecedented surge of introducing BRT as a mass transit option is found in mega cities of Asia. The global BRT data clearly indicates that out of one hundred and sixty six BRTs worldwide forty three are already in Asia while many more are in the pipeline (BRT, 2018). But the nature of BRT in conjunction with the form of the city is relatively an unexplored feature, particularly in South Asia. It needs further attention of both the transport policy makers as well as of the urban researchers to determine the possible benefits of this mobility solution in terms of urban development (Cervero and Dai, 2014, Wright, 2014, Newman, 2005).

The aim of this research is to determine the potentials of BRT in changing the urban form of the city aligned with the available transit services in a more sustainable way. The BRT potentials are explored in a case study-based approach by determining the nature of BRT that is implemented in Lahore, Pakistan. At first, a comprehensive literature review of BRT focusing towards the nature of implemented BRT projects in developing countries is included. Later, a list of critical factors determining the success of BRT as an urban planning approach is identified in the context of the developing countries.

In the subsequent section of the paper, the type of bus rapid service executed in Lahore is explained. The type of BRT here is explored based on the existing features as well as on the acuties of the local planning professionals of Lahore. The analysis is completed with semi structured interviews from experts of urban planning in public-sector, members of Lahore Development Authority (LDA), private consultants, real estate developers, academics and researchers.

Finally, the concept of Neo-Traditional neighbourhood design as an upcoming approach of new urbanism in conjunction with the existing transit facility is suggested for Lahore. The Neo-Transit Lahore model is recommended to be applied along the metro bus stations as a first step to change the existing transit areas into Neo-Transit neighbourhoods.

BACKGROUND

Progression of BRT

The concept of BRT started in 1930 from Chicago, North America as a bus priority lane but it got popularity in 1970’s when it was implemented as the first BRT system in Curitiba, Latin America (Levinson et al., 2003). In Curitiba, the concept was introduced not only as a mode of transport but as a tool of urban development. The visionary Mayor of Curitiba, Jemmy Lerner envisioned BRT as a catalyst to induce urban transformation in the city. To contrivance the city vision, local transport experts collaborated with urban planners and architects with complete political support. A comprehensive development plan was developed as a part of this project where bus corridors were supported with the updated zoning regulations. This plan enhanced the component of mixed land uses as an urban policy with varied degree of urban densities along the bus routes. Therefore, BRT in Curitiba not only supported the urban mobility but created the modern urban fabric of the city as well (Cervero and Dai, 2014, Lindau et al., 2010, Andrade, 2013).

After Curitiba the city of Bogotá was considered another success story in BRT progression. In Bogota BRT was introduced in the form of Transmelnio and got phenomenal success being an affordable transportation mode. Here the concept was mainly introduced as a mode of mobility to overcome the transportation needs of the citizens who could not afford private travel. The policy makers of Bogota focused on enhancing the access factor for mobility rather than the development factor of the city. To support urban poor, cycling and walking facilities were designed as a part of Transmelnio service. Eventually, the citizens were provided with efficient and affordable service in the form of transit along with non-motorised modes (Cervero et al., 2009). In Bogota the ‘Transmelnio’ proved as a revolutionary step in public transport system of the city (Hidalgo, 2003, Ardila-Gomez, 2004).

The Bogota model attracted the policy makers of Asia because it was considered as cost-effective and easy to implement option. Jakarta, Indonesia was the first Asian city where the concept of Trans-Jakarta was implemented in 2004, with the collaboration of the Mayor of Bogotá (Hossain, 2006). In Jakarta BRT was termed as a cheap mobility option and the policy makers adopted the single bus corridor approach that later ended up into three other corridors without integrating any significant planning measures. Like the name Trans-milenio the Trans-Jakarta was implemented by the local experts only as a mode of public transport (Kumar et al., 2012, Matsumoto, 2006).

In Asia, China is the biggest devotee of BRT and Beijing BRT was developed after Jakarta in 2005. Till date twenty cities have adopted BRT in China and about ten are in the phase of planning (BRT, 2018). In most of the Chinese cities this service is working on a network-based approach. The organic nature of old Chinese city centres supports the non-motorised travel as a complementing factor of this service. However, in most of Chinese cities BRT is still operated as a feeder service for light rail trains (Andrade, 2013, Matsumoto, 2006).

Seoul, Korea is another example where BRT was embraced in 2005 and it is considered a patent Asian BRT. Because in Seoul the concept was not only adapted as a mobility solution but as a component of the comprehensive urban policy. Therefore, instead of following one city model, the lessons from both Curitiba and Bogota were derived and executed with the help of the local bus operators. The technical design requirements were completely formulated by the local experts and later the local bus operating companies were engaged to develop this new system. In Seoul the major focus was to enhance the city economy and urban life. That's why the policy makers engaged local experts and operators to share the ownership of this project to the locale. Likewise as a part of the project the concept of transit neighbourhoods was promoted and within five hundred meters around the station urban activities such as shopping, walking and green spaces were emphasized (Matsumoto, 2006, Hossain, 2006).

The latest successful BRT in Asia is considered '*Janmarg*' in Ahmedabad, India. This city followed Curitiba and initiated the BRT concept. Although eight cities of India have also implemented BRT but *Janmarg*

(the people way) of Ahmedabad was declared as one of the best BRT of the country (Kumar et al., 2012). It started in 2009 and the ridership increased three times from 2009 till 2016 (Kathuria et al., 2016). Furthermore, this BRT project is completely backed by the local urban planning agencies. A comprehensive zoning plan along the transit corridors with varied floor area ratio, as well as development incentives for private developers and comprehensive city renewal plan are part of this BRT project. In the last three years the academic and professional researchers of transport planning in South Asia have explicitly quoted Ahmedabad as a good example to learn lessons from for future cities who intend to adopt BRT system (Rizvi and Sclar, 2014, Kumar et al., 2012).

The comprehensive literature review indicates that in Asia, BRT is envisioned mainly as a mode of transport by the policy makers with few exceptions (Kathuria et al., 2016). Therefore, the benefits are limited towards transporting people from one place to another. It is found that there are several reasons behind this mode only approach of BRT and the regnant one is quick implementation of the service if dreamed as a mode only solution. It is evident from the examples that if the BRT is planned only as a transport mode it requires less time and resources for execution. Therefore, easy and quick implementation- as a mode- is a big attraction for politicians who are interested to introduce the new concept in a single political tenure (Wright, 2014, Rizvi and Sclar, 2014). Nevertheless, the concept of BRT has become a panacea for all transportation problems, but how the Asian cities envision this concept needs to be explored further (Currie and Delbosc, 2011, Suzuki et al., 2013, Hossain, 2006). This paper describes how the policy makers of Lahore have visualised the concept of BRT.

Lahore- the selected case study

Pakistan is a new entrant in the BRT club in comparison to its neighbouring countries like China and India. Albeit policy makers of Pakistan were aware of the challenges of urban mobility and the country was looking towards mass transit systems since 1990 (Haider, 2013, Imran, 2009, Imran and Low, 2003, Russell and Anjum, 1997). But the unstable political conditions and lack of financial resources acted as major hindrances in the way of introducing transit system in its mega cities and eventually the dream came true in 2013 when the first mass transit option

in the country was introduced (Haider, 2013, Haider and Badami, 2004).

The provincial capital Lahore with eleven million population took the lead and the first mass transit service in the form of metro bus was implemented here. The Lahore Metro Bus Service (LMBS) as claimed by the then Chief Minister of the province, is a ride of a common man and is provided to overcome the needs of the urban poor of the city. The salient features of Pakistan's first BRT are:

- a) Dedicated bus route in the form of twenty seven km corridor
- b) Fleet of eighty six articulated buses
- c) Total segregated corridor with one third elevated section
- d) Entry restricted of any other mode of transport as it is a bus only corridor
- e) Median bus way and stations
- f) Pre-board fare collection system
- g) Complete distinctive marketing identity as compared to rest of public transport modes

With these features, LMBS is appreciated by transit users and a significant ridership is observed. The ridership of 180,000 passengers per day is reported by the Punjab Transit Authority (Ahmed, 2016). It is also claimed that this service has improved the environmental conditions of the city by cutting down fifty percent private trips of motor bikes on major Ferozpur Road (Hameed and Anjum, 2016). Albeit, the provision of LMBS is a phenomenal step in the history of public transport of the city but the metropolitan Lahore is still looking for suitable planning strategies to turn this transit service into a tool for urban transformation of the city.

Lahore is the second largest city after Karachi in Pakistan, and certainly required efficient public transport system, but the local academic experts, researchers and practitioners of urban and transport planning have repeatedly pointed out the need of a well-articulated development plan with the efficient public transport. This combined approach of urban and transport planners is needed for the LMBS as well, to initiate the concept of compact urban development instead of enhancing the concept of urban sprawl in the city after the implementation of this service (Imran and Pearce, 2016, Imran, 2010, Rana et al., 2017).

Lahore used to be the 'Mughal city of gardens' in older times (Naz and Anjum, 2007) but now this city has become a victim of massive urban growth, inadequate infrastructure, high traffic congestion, severe air pollution and increasing urban poverty. The older garden city, at present is in phase of urban transition and is looking for some sustainable measures to narrow down this gap. Albeit one step towards sustainability has been taken by introducing transit system in the city and second possible step could be to reduce the share of motorised modes by integrating more active public transport options-walking and cycling- along the transit. It is assumed that provision of transit facility could help to initiate this safe, healthy and sustainable way of travelling at least in the immediate neighbourhoods. But how to create such neighbourhoods as an urban policy feature is an import question that is discussed in the next section.

CRITICAL FACTORS DETERMINING THE NATURE OF BRT

From comprehensive literature findings related to the role of BRT particularly in Asian cities, a list of factors making BRT successful as an urban policy component are put together. It is also determined that in Asia the model of Bogotá, based only on mobility option is preferred due to political support, having interest to implement it in a single political tenure (Wright, 2014). However, the example of Curitiba is neglected in many cases because it needs comprehensive planning and a considerable time frame to implement. Based on previous studies the following parameters are selected as a list of success parameters for the BRT as a component of an urban planning policy for Lahore (Hidalgo and Munoz, 204, Yazici et al., 2013). These six parameters are practised in cities where BRT worked as a tool for urban policy for instance in Curitiba, Seoul and Ahmedabad.

- a) Strategic vision behind BRT
- b) Strong political endorsement
- c) Comprehensive land use support
- d) Grass root level community acceptance
- e) Incentives for private developers
- f) Multi-tier transit-based development plan

Methodology- LMBS in the eyes of urban planners of Lahore

The alluring question of this research is to determine how did the policy makers of Lahore envision the new concept of transit in the city. The answer to this question was explored through semi structured interviews with the urban planning policy makers of Lahore. Priority was given to the planning practitioners of the Lahore Development Authority (LDA) because they were considered the key planning personals in the decision-making process regarding LMBS.

The discussion started with their experience of working on this project and about the vision of LDA in this regard. According to the stated vision of LDA, the authority aims to turn Lahore into an 'attainable city'. Further explanation for the word attainable was asked for and with consensus it was concluded that this term referred to a manageable city.

It was highlighted by the planners of public sector that in Lahore the decision of implementing LMBS was narrowly focused towards the 'engineering nature' of this facility. They explained by quoting various events during implementation that only the hard-core infrastructure and quick completion was the main concern for the decision makers. Albeit huge transport infrastructure projects always had challenges for the policy makers, but successful outcome can not be linked only with hard components of projects as suggested by Flyvbjerg et al., (2003). While in Lahore although the BRT project was completed in record time of eleven months but only the hard-core infrastructure (the route design, station design, buses etc.) was the focus of attention of the decision makers. While the soft components such as planning regulations, new zoning policy for the transit corridor, area development plans and the incentives for the private developers, that could have complemented the transit facility in terms of urban development were not part of the project considerations.

It was further elaborated that since the inception of the project it was envisioned as a traffic engineering solution for the city to overcome the traffic congestion and was handled only on a technical basis. It was also accentuated that no representative of metropolitan planning section of LDA was part of planning team of LMBS during the design phase; however, the engineering section of LDA was involved in all the

planning phase meetings of LMBS. Even the emphasis of policy makers was more on selection and construction of the bus routes, stations, junctions and other traffic engineering components such as intelligent traffic system and signalisation on the route etc. The role of existing land use, the potential changes after this service and the current socio-economic conditions of the users along this route were all salient features in decision making of LMBS.

One of LDA's expert described that during the implementation of this project the role of planning institutions was limited while the Traffic Engineering and Planning agency (TEPA) on behalf of LDA was an active participant. TEPA was responsible to design and construct the infrastructure based on specifications finalised with international (Turkish) experts. Later, at the local level construction firms such as NESPAK and Habib Constructors were involved to construct the infrastructure, but the measures for urban development remained absent in this whole plan. In short, it was obvious from the LMBS plan, design and service of the facility that it was handled as an engineering solution and not as a development feature of the city. Albeit the role of planning organisation was limited or negligible at the time of planning and implementation of the route of LMBS, but at present local planning authorities could play the role by developing a suitable strategy to initiate a controlled and compact future development along this service.

Regarding the potential role of LMB from the perspective of urban development a focus group discussion was conducted with the planning officials of various organisations, the real estate developers, and the academic researchers. In this discussion the nature of BRT in Lahore was questioned. It was expressed by all groups that in Lahore at present this service is acting only as an improved public transport mode. However, the long term sustainable impacts of this service could only be visualised, if it were implemented with the socio- technical characteristics of the city attached with local cultural, social and planning considerations.

One of the representative of real estate agents also informed that the land value had increased almost two to three times around the corridor of Metro bus Lahore in the past three years. He further explained that an ongoing trend of land use conversion had started. This trend was observed more in certain belts such as Ichra,

Shama, Qanichi and Mazang etc. Although, LMBS has affected the land values and conversion of land uses from residential to commercial or from small commercial units towards larger ones but the city government has not paid much attention to regularise this development trend or even to channelize or accelerate this trend. Keeping in view the development potentials, the private developers endorsed that they were ready to invest and take advantage of this transit facility in terms of development feature of the city, but they were looking towards an approved public-sector development policy in this regard.

To formulate the development plan along the transit route, the location of the route and the nature of surrounding land uses were considered as critical factors. Regarding the selection of the route the Ferozepur Road was agreed upon by the urban planners who endorsed this selection as a favourite corridor for the transit facility on the following basis. From the geographical point of view this three lane Ferozepur Road connected north-south areas of Lahore from Shahdrah Chowk to Kasur District as shown in figure 1, which is an important connection in the city. It was also declared as a highly congested road in terms of traffic and about more than sixty percent private trips of motor bikes were recorded on this route, as reported in urban transport master plan of the city. It was assumed that this mega transport facility would cut down private trips, whilst the results of this assumption are not yet evaluated. Although high passenger ridership indicates that the service was a need of the city from the transport point of view, but the decision for future extension could not be made only on the grounds of traffic demand. The landuse condition along this transit route is equally important and must be kept in consideration for future transit-based development decisions.

Regarding the pattern of the land uses and the type of development along the metro bus route it is explored that the route included a variety of mixed uses ranging from high dense urban areas of the city such as Mozang, Ichara, Niazi chowk and medium and low dense areas along the terminal stations. Furthermore, the organic nature of the settlements also supported the idea of transit very well. Overall, the development pattern is wide-ranging, at one hand there are planned new communities such as Model Town, Garden Town and Iqbal Town, while on the other hand the old unplanned areas with mixed uses are observed such as Shahdrah, Niazi Chowk, Qainchi stop and Islam Pura. The

institutional and cultural entities are also linked with this route such as Anarkali Bazar, Dinga Singh buiding Katakchri, Civil Secretariat, the old campus of Punjab University and Government College Lahore. Therefore, the diversity of land uses along with historical importance has significant potential for urban transformation in the city.

From the perspective of urban design, it was agreed that the route had significant potential to revitalise the old city parts and realign the street connections where LMB route was elevated, but unfortunately this component was completely ignored by the policy makers. The example of Ahmedabad was repeatedly quoted by the experts where the BRT service was linked with the Nehru Revitalisation Project of the city, but in Lahore no measures were designed to uplift the old historic urban fabric along the route. At present another transit service in the form of light rail urban rail named Orange Line Metro Train has also started in the city running in the northern section (figure 1). It is therefore high time to realise the importance of integrating the urban design measures along the transit services in the city to make these decisions compatible with the urban morphology of Lahore.

In Lahore the metro bus service is considered as a ride of urban poor and the use of a car is symbolised as a status icon instead of mobility option. The reporting from previous studies on LMBS proved that the highest



Figure 1: Map of Lahore Transit System

number of transit users, approximately fifty two percent of the total commuters, approached this facility as pedestrians; however, the mode shift from car to bus was negligible, about three percent (Tabassum et al., 2017, Ahmed, 2016). In this situation how does one utilise the strength of the existing captive transit users, is a key question.

This research therefore ponders the possibility about how walkable transit neighbourhoods could be introduced in the city as a first step towards transit-based development strategy. Albeit, the previous research in urban planning supports this idea in the form of Neo-Traditionalism where walking is the key component of Neo-Traditional Neighbourhoods (Thomas et al., 2018), but to check the possibilities of this concept in Lahore the communities along the metro bus route are analysed under the framework of Neo-Traditional Neighbourhood design option as an upcoming approach for future development.

NEO TRADITIONAL NEIGHBOURHOOD DESIGN (NTND) APPROACH

The concept the of Neo-Traditional Neighbourhoods originated in early eighties in United States but now has invaded popularity as the latest fad among the planning professionals around the globe. It promotes the confined densification to promote environment friendly communities. The key proponents of this idea are architects Florids and Andrés who started designing neighbourhoods based on the principles of older communities. They idealise the American cities of 1920s as "good" urban designed settlements where people used to walk instead of using cars as mobility options (Christoforidis, 1994, Davies and Townshend, 2015). In contemporary literature of urban planning the scholarship that Neo-Traditionalism limits the auto-based mobility and promotes the use of non-motorised travel is promoted by urban planning theorists.

According to the Neo-Traditional Design approach it was assumed that people do what planners want them to do by arranging the city land uses. Based on this assumption it was concluded that car usage increased because after World War II, the concept of automobile circulation was encouraged by the urban designers themselves through functional zoning regulations where all the activities were separated. In the absence of functional zoning people could indulge in daily activities with active modes such as walking and cycling, in an

environment friendly neighbourhood where children used to play without fear of cars. Urban designers such as Plater-Zyberk and Peter Calthorpe also support this neighbourhood approach by integrating the use of public transport as a key component of Neo-Traditional Communities. In this approach instead of cars the emphasis is on the use of mass transit and non-motorised modes. The transit based development, also termed as transit oriented development, is considered a key step towards sustainability in the eyes of transit experts (Cervero, 2015, Cervero, 2013, Cervero, 2004, Suzuki et al., 2013). However, to design Neo-Traditional neighbourhoods transit planners, urban designers, architects and real estate developers have had to work together.

The concept of Neo-Traditionalism could be approached at three different levels, starting from regional level to the city and then at the neighbourhood level. In this research the focus is on the neighbourhood level. By applying the NTND approach at micro level the transit neighbourhoods along the LMBS corridor have been analysed and potentials of this concept have been explored in the case of Lahore.

Parameters of NTND

The core objective of this approach is integration of urban land uses to reduce the vehicle kilometer travel. This design approach encourages grid iron pattern of street connections with maximum circulation in urban space. It supports the concept of transport planning linked with urban functionalities in the city. The idea of integrating transport in physical planning itself is not a new concept. The work of Howard is considered the earliest effort in this regard who introduced the idea of neighbourhood in Garden City. Later the concept of transportation network in the Garden City was characterized by the circular road patterns and segments of Garden City were connected to the central part (mega polis) through transport links (Sharifi, 2016).

While in contemporary era of planning theory the scholars are now again focusing to restore the original patterns of towns by designing the transit corridors as central part of the communities. As suggested by Calthorpe the concept of 'pedestrian places' could be designed near bus rapid transit or near light rail transit station where people would rely on transit rather than using cars to approach the daily activities. This concept is further endorsed by Cervero (2013, 2015) that transit



Figure 2: Parameters for Transit based NTND Communities (Cervero and Kockelman, 1997)

could also be an appropriate choice for the urban poor when complimented with the non-motorised modes. Based on these concepts the following components are suggested to design the Neo-Traditional Neighbourhoods (figure 2).

- a) Access through grid iron parameters
- b) Mixed residential and non-residential uses
- c) Maximum connectivity of neighbourhood
- d) Integration of public space
- e) Promotion of non-motorised movement

How NTND compliments transit service

It is suggested by Ewing and Cervero (2001) that accessibility and neighbourhood designs complement each other. By comparing the travelling trends in car-based communities versus transit-based communities they conclude that the basic difference in traveling is due to physical design parameters of those communities. These parameters are street layouts, blocked spacing in urban areas, connection between alleys, provision of pedestrian facilities, integration of bicycle networks, type of links between residential and commercial activities, connections between daily activities etc. It is therefore suggested that physical design of a settlement should promote the traveling options and accordingly travelling behaviour would differ in various communities.

Now if we the travelling trend between developed and developing nations is compared, it is evident from various studies that pedestrian share of captive transit users are more in developing countries, where land uses are connected due to organic mixed nature of land uses (Cervero and Radisch, 1996, Cervero and Kockelman, 1997). The theory of commuting within communities (proposed by Dill, 2004) also confirms that albeit Neo-Traditional neighbourhoods could attract maximum number of non-motorised trips but it would depend on how the land uses are designed and connected. Furthermore, a recent study in Malaysia has also endorsed this viewpoint of transport scholars that the pattern of mega cities in Asia in general supports the idea of transit based development due to high densities and mixed landuses (Yap and Goh, 2017) (figure 3).

Ewing and Proffitt (2016) also prove that there is proportional relation between the travelling time and the travelling distance because travel time decreases in highly accessible communities due to mixed land uses. Based on these findings it could be summarised that traveling patterns are based on physical parameters and these parameters connect and promote mixed land uses. According to the conclusions drawn by Ewing and Cervero, by altering the forms of neighbourhood designs, the travel pattern of these areas could also change. Therefore, it is agreed by the urban designers that NTND with transit facility would complement

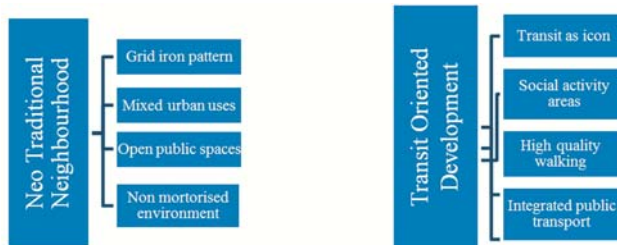


Figure 3: Parameters of Neo-Traditional Design Approach and Transit Oriented Development

each other. In this research this assumption is tested within the existing mass transit areas in Lahore.

NEO-TRANSIT LAHORE MODEL (NTLM)

In this paper a model along the metro bus route in conjunction with Neo-Traditionalism named Neo-Transit Lahore Model is designed. This model was analysed along three transit stations in Lahore, namely Ichra, Shahdara and Mall Road. These neighbourhoods were selected based on the land use pattern and behaviour of transit users. Ichara is a commercial area, Shahdrah is a residential community and Mall Road is an institutional zone. Therefore, these three areas provided the idea of diverse land use patterns along the metro bus route. Further, in these neighbourhoods' people approach the transit stations preferably as pedestrians instead of using other modes of public transport such as feeder buses, auto rickshaws and motorcycle rickshaws. The information provided by the Punjab Transit Authority also confirmed that the percentage of captive transit users is maximum along these stations.

A survey regarding the affordability of private modes along the transit neighbourhoods was conducted in 2015 as an academic project by the undergraduate students of Department of City and Regional Planning, University of Management and Technology Lahore, and the results revealed that approximately 74.8% of metro bus users had household income of around 25,000 PKR or even less. Therefore, the private vehicle affordability was limited and use of public transport for daily activities was the need of the citizens. However, people from high income group having cars did not use metro bus considering it a mode of urban poor of the city. It was further reported that the percentage of young workers and students was maximum towards transit use who walked from origin to destination. While female commuters and old aged passengers preferred to use auto rickshaws and motor cycle rickshaws to reach the station due to unsafe and uncomfortable pedestrian conditions (figure 4). These results were based on questionnaire survey with the passengers approaching the transit stations. It was also noted that the trend of walking in transit areas was based on personal choice and not as an outcome of LMB service, because no additional pedestrian measures were provided by the policy makers to promote walking or cycling along the transit corridor.

Regarding the pedestrian provisions along the metrobus route it is important to mention that albeit pedestrian measures in the form of pedestrian overheads and escalators at stations, promotion of active modes to access the transit stations as component of LMBS design are missing. It is also important to mention that



Figure 4: Pedestrian measures along main roads in Lahore after Transit services



Figure 5: Urban fabric of Lahore after LMBS

in Lahore not a single bicycle lane is provided as part of the facility, however in model BRT cities such as in Bogota and Curitiba bike sharing and cycling along the transit was highly promoted. The urban fabric of Lahore, after the introduction of LMBS is shown in figure 5, and it clearly depicts that provision of active modes of traveling and change of urban design in terms of urban transformation is not considered as a part of this transit facility.

From the initial findings about the nature of metro bus transit it is recommended that in Lahore the component of non-motorised access must be included as a part of the existing transit facility. Although, it could be challenging for Lahore to start this approach but it has already been successfully implemented in many other developing cities with certain variations such as in Bogota, Curitiba, Seoul, Ahmedabad and Jinan (Suzuki et.al., 2013).

It is also suggested that LMB could be used to attract the other features of Neo-Traditionalism as well, such as high dense urban development, variety of urban uses, mixed residential and non-residential activities. These features would not only complement the transit service in terms of more passenger ridership, but the concept of transit-oriented development could also be

promoted. The components of transit oriented development are urban compactness, high dense mixed land uses and provision of public spaces in the transit neighbourhoods (Vuchic, 2017). Therefore, both the Neo-Traditionalism as well as transit-oriented development in principle support each other to minimise the use of private cars and to promote the usage of public transport in conjunction with non-motorised mobility.

Therefore, keeping in view the mobility trend of current captive transit users as well as the future potential of active modes in transit-based neighbourhoods, the Neo Transit Lahore model is suggested. It would be useful to promote the trend of commercial activity as well as mixed land uses along the transit corridor. This model would be applied as a stepwise approach and in this study, the focus is more towards the provision and promotion of pedestrian environment in the transit neighbourhoods. The steps of Neo-Transit Lahore Model are shown in figure 6, and details of these steps are discussed below.

1. Create planning buffers

First step of this model is to determine the area of transit neighbourhoods where Neo Traditional measures

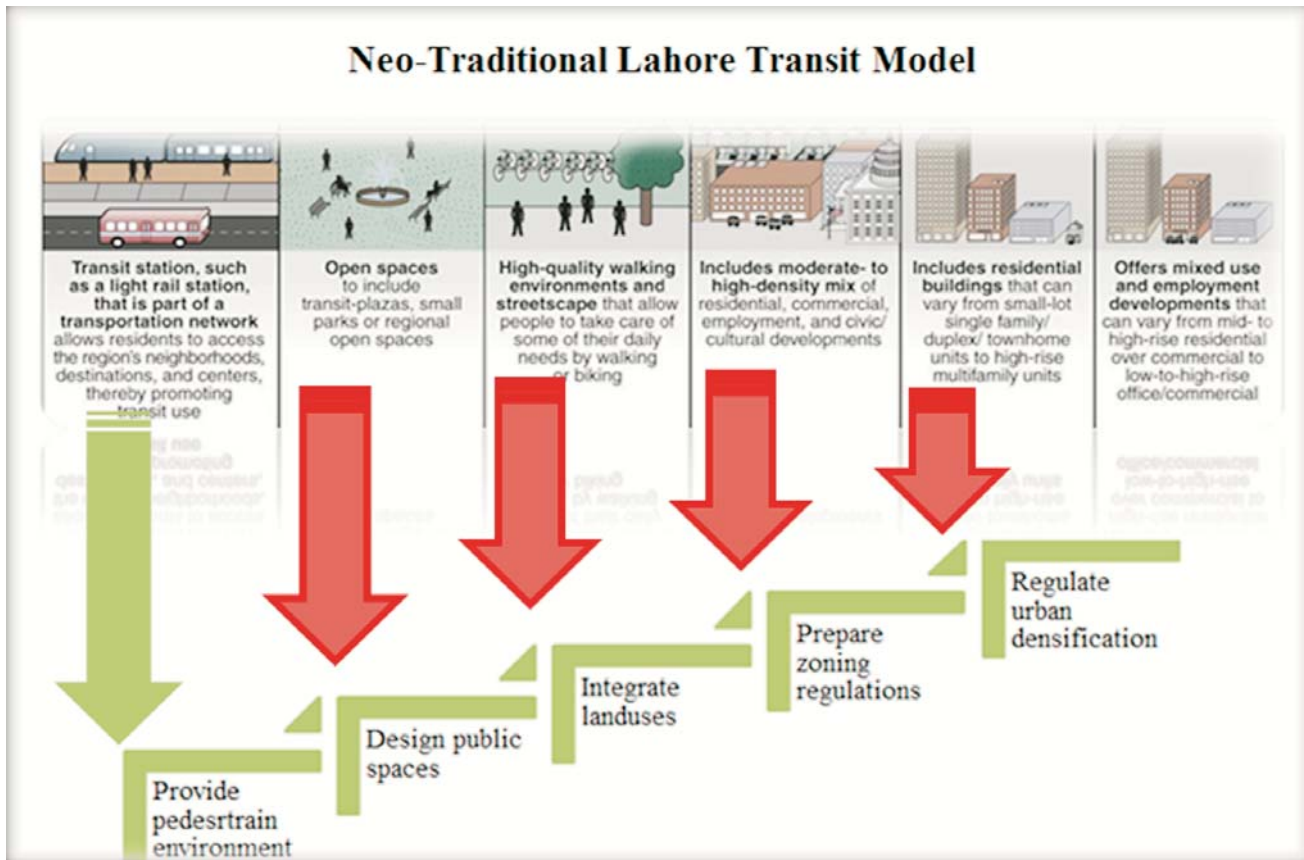


Figure 6: Neo Traditional Lahore Transit Model

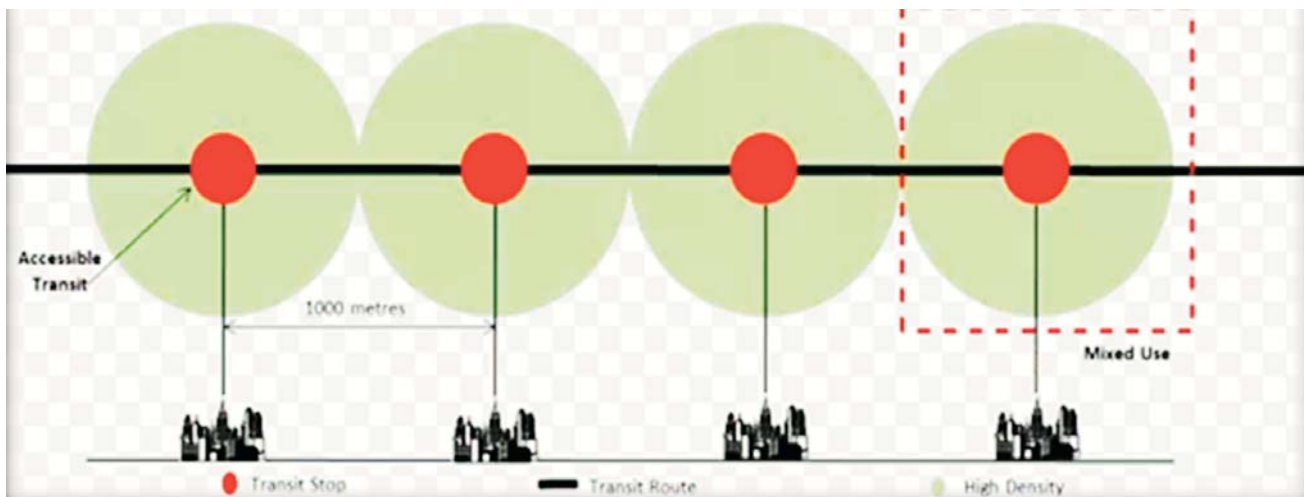


Figure 7: Design framework to create planning buffers along the Lahore metro bus transit station
Source: Adapted from Akbari et al., 2018, Newman, 2005.

could be designed. At present there is no concept of designated transit neighbourhoods along the station. There are twenty seven stations and on average the station distance is about one km between each station.

In figure 7 the transit stations are marked with red point, these stations are connected through the bus corridor. Along the corridor a dense development circle is suggested, within five hundred meter distance of

the main station. The area of five hundred meter is selected based on the criteria of accepted walking distance within transit neighbourhoods from the previous practice of BRT in Seoul, Curitiba and Ahmedabad. In the designated planning buffer within half meter street connections and walking pathways would be realigned to ensure the grid iron pattern with maximum connectivity and circulation in the urban fabric of the city.

2. Improve walking environment

The second important step is to promote usage of active transport modes at least within the designated planning buffers. At present the pedestrian measures are provided only at site, mostly inside the metro bus stations in the form of pedestrian overhead bridges and escalators, but the overall approach supporting how to reach these stations as a pedestrian is narrowly focused. Therefore, to ensure the safe pedestrians access towards stations and within community uses the provision of sidewalks, pedestrian crossings, pedestrian signals and zebra crossings along the main streets is necessary to be provided. These measures in the form of network would be designed in first phase along the transit stations. The distance from the main station is divided into three sections, the quarter a mile, half a mile and above (figure 8). Starting from transit station, first the transit core within two hundred fifty metres could be designed and later the distance of five hundred meter and eight

hundred meters could be considered according to the urban density in these areas.

3. Plan quality open urban spaces

The provision of high quality urban spaces is another important step to induce urban transformation in the city. By using the concept of brown field development, the old places that are of no use could be developed into new green open spaces. The old railway tracks and depots along this route could also be turned into urban green areas. The creation of green spaces will not only act as lungs for urban life but the social life of residents in these neighbourhoods would also be enhanced. At first, the land of LDA and the respective towns linked with metro route need to be identified and later the possibility of developing green areas on public-private partnership could be developed, by involving private land developers.

4. Comprehensive urban density plan

To initiate transit-based development in Lahore a comprehensive development strategy based on transit facility is needed. This strategy could be prepared by the local planning agencies along with the land use plan and new proposed urban densities. The concept of Neo Traditionalism would be supported by the comprehensive new zoning plan. But a plan of existing buildings determining the urban density along the

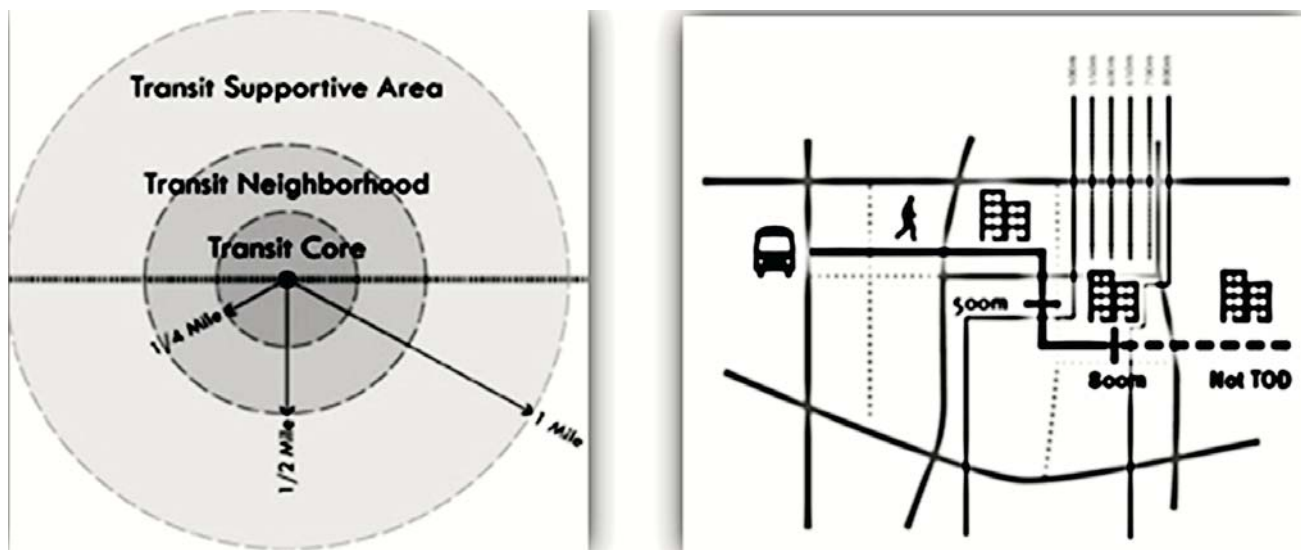


Figure 8: Stage-wise creation of walking environment along the metro bus station Lahore
Source: Adapted from Levinson et al., 2003, Suzuki et.al., 2013.

transit corridor must be prepared followed by the proposed future urban density plan suggested by the urban designers of the city. The new density plan and zoning regulations should support flexible floor area ratio as practiced in Curitiba and Ahmadabad. The new urban density plan would also help to initiate the use of active modes as part of Neo Traditionalism in the transit neighbourhoods.

BENEFITS OF NEO TRADITIONALISM IN THE LOCAL CONTEXT OF LAHORE

The Neo-Traditional Neighbourhoods could have several benefits in Lahore. This approach was highly practiced in Europe and due to colonial remains the older parts of Lahore still reflect the potentials for this practice. For instance, in the Walled City, Sanda, Krishan Nagar and Ichra, the communities with mixed residential and commercial entities and short travel distances for daily activities is a prominent feature. In older times walking was a preferred mode of travel because the lower middle-class communities could not afford private travel modes. Still in these communities car ownership rate is not high but walking is replaced by use of motor bikes as an affordable private mode. Therefore, the traditional old pattern of these settlements naturally supports the idea of Neo-Traditional Neighbourhoods and this concept could revive the trend of walking in these communities.

From the economic perspective this approach is highly beneficial because it would cut down the automobile trips and consequently fuel expenditure could be reduced. In a country like Pakistan where energy crisis is at its peak and fuel costs have reached four times (Javaid et al., 2011), the concepts of old style neighbourhoods could reduce the cost of motorised trips and indirectly would contribute in managing the energy crisis of the nation as well.

Another significant advantage is the possibility to enhance historical value and cultural diversity in Neo-Traditional Neighbourhoods at a micro level, particularly at street level. The individual sites having strong heritage links could be selected, renovated and promoted for tourist attractions. In this way both tourism and traditional heritage would be positively impacted. Places like Anarkali Bazar, Tollington Market, Ichra Bazar, Food Street and other famous monuments located along LMB corridor could be renovated and promoted for tourists.

From the social perspective this approach would enhance social equity because according to the transport master plan study of Lahore more than half of the total population of Lahore cannot afford private travel modes (JICA, 2001). Therefore, significant proportion of urban population relies either on public transport or on para-transit modes for daily travelling. In this situation the concept of metro service was initiated by the political slogan that it is a ride of the common man. To make it a real common man ride it is necessary to promote the integration of non-motorised modes with LMB because majority of the captive transit users are pedestrians. Furthermore, the Neo-Traditional Neighbourhoods would make communities more inclusive. By connecting areas with transit and by promoting open green areas in these communities the interaction of people would enhance, making urban fabric more inclusive and sustainable.

The environmental benefits of this approach are obvious in the form of pollution free, healthy, open green areas. The City of Lahore is overcrowded and messed up with high rate of motorisation due to motor bikes and para-transit and by implementing this concept the transport-based emissions could be reduced. The concept of green modes travelling in the form of transit and active modes such as walking and cycling would enhance as well.

CONCLUSION

This research first determined the nature of the BRT service implemented in Lahore and concluded that the LMBS is applied here as a standalone transport component therefore the benefits of this approach are just limited to moving people from one place to another. However, if it was envisioned as a component of an urban policy then it could have had leverage and would have connected to the urban form of the city as well.

From the perspective of urban planning the concept of Neo-Traditionalism is suggested in conjunction with the existing transit service. Based on this approach at local level a development model named Neo Transit Lahore Model (NTLM) is recommended to maximise the future benefits of the existing transit facility. This model could be applied along the transit areas of the LMB corridor. The model would be beneficial due to the organic nature of existing settlements having mixed use development across the transit neighbourhoods in Lahore. It would also be helpful in formulating a future

urban planning strategy incorporating more green spaces as well as the enhanced non-motorised mobility in the city.

The suggested model is an outcome of an integrated planning and transportation vision for the city, where the bus transit corridor would act as a catalyst in turning the existing communities into future Neo-Traditional Neighbourhoods in Lahore. The parameters of Neo Traditionalism approach highly support active commuting to compliment the provided transit service. It is assumed that the Neo-Traditional approach will encourage people to walk instead of using automobiles. This assumption is made due to several reasons, such as limited affordability of private modes, high fuel

expenditures, narrow streets, lack of secure parking spaces for private modes and poor public transport provisions in terms of route coverage of conventional buses and wagons.

The application of the Neo Traditional Neighbourhood Model approach would have social, environmental and economic benefits for the city as well as for the citizens. The outcomes of this study could broaden the understanding of policy makers and the local land developers in conjunction with New Urbanism. Further research is however needed to explore the role of urban planning and urban planners while designing the upcoming transit projects for other cities in Pakistan.

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