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Sustainable Urban Mobility for Karachi - A Strategic Framework

SUSTAINABLE URBAN MOBILITY FOR KARACHI - A STRATEGIC FRAMEWORK

STRATEGY PAPER

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In collaboration with

Friedrich Naumann STIFTUNG FÜR DIE FREIHEIT

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CONTENTS

FOREWORD

Karachi is faced with numerous challenges of sustainable urban growth. Urban transportation is one of them. We do not have a viable public mass transit system, number of private vehicles keep increasing in the city and there is no effective regulation of the road worthiness of vehicles. Not one single factor can be identified for causing the ongoing crisis, however, of critical importance is a lack of proper legislative and institutional framework governing the sector. There is a total disarray with responsibilities and functions divided in the absence of coordinating mechanisms. Laws have not been appropriately updated to accommodate aspects such as the vital connection between transport planning and land use planning. There is an urgent need to update legislative frameworks and ensure that the wider aspects of transport and mobility planning are properly incorporated.

This Strategy Paper addresses this sector within a broader framework of policy, planning, strategy, implementation, monitoring and regulation requirements of urban mobility. Based on a careful analysis of how investments in the sector have been made in the past, how policies and institutional frameworks have changed over the years and how informal mechanisms of service provision have impacted sector growth, it is felt that the strategic roadmap for change identified has the capacity to influence positive change if properly implemented. Shehri-Citizens for a Better Environment strongly upholds the importance of effective legislation and its strict implementation coupled with viable institutional mechanisms for implementation and regulation. These are the critical areas for focus within the urban mobility and transportation sector in Karachi for bringing about positive and sustainable change.

Amber Alibhai
General Secretary
Shehri-Citizens for a Better Environment

INTRODUCTION

Climate change is now considered as the most potent challenge facing humanity at large. The implications of a changing climate are now well documented. According to the *United Nations,* 13 of the 14 hottest years on record have occurred since the year 2000. Natural calamities are occurring at an increased frequency and with greater intensity. It is being realized that the major battles in tackling the consequences of climate change will be fought in the urban centers. This is because, for one, the mass of humanity will be inhabited in the cities - According to a conservative *World Bank* estimate, by the year 2050, almost 75% of global population will be residing in cities. In addition, most of the factors contributing to climate alteration are housed in the cities. Among these factors is urban transportation. According to the data compiled by the *Inter Planetary Commission on Climate Change (IPCC) of the UN,* 26% of the global Green House Gas emissions are attributed to the transport sector. As such, there is an increased focus on transitioning to smarter modes of transportation and cleaner fuel options - discouraging the use of automobiles and promotion of public transit and walking and cycling. In addition, methodologies like *Transit Oriented Development (TOD)* are being interfaced with public transit systems to promote improved urban mobility and smarter and more sustainable urban land use and development.

Pakistan is critically challenged when it comes to climate change and has been ranked as the 7th most effected country by climate change in the *Global Climate Risk Index of 2017,* prepared by *Germanwatch.* Pakistan is also rapidly urbanizing with an average annual rate of urbanization exceeding 4 per cent since 1951. The *Planning Commission, Government of Pakistan* estimates that by the year 2030, Pakistan will be predominantly urban with 45.6 per cent of its population living in urban areas and about 12 cities housing more than one million people. The level of urbanization of 45.6 percent would then be the highest amongst the South East Asian countries. While urbanization is a global phenomenon, what is a matter of concern for us is that our cities are expanding without the provision of necessary social and environmental safeguards and consideration for sustainable development. In terms of urban transport, there is heavy dependence on private vehicles and minimal regulation is employed to ensure road worthiness of vehicles that includes regulating vehicle emissions. While in some cities, initiatives have been taken to introduce public mass transit facilities, it is a matter of concern that they are not being effectively merged within a larger urban growth agenda of improved urban mobility meaning that the benefits attained may not get optimized.

If we take the case of Karachi city, then we are faced with a number of challenges related with urban mobility and a complete absence of basic considerations of smart transportation. At the core of this crisis is lack of public mass transit and growing dependence on motorized forms of transport. Focus has been more on increasing road widths, making expressways and flyovers - the type of transportation

infrastructure that promotes and facilitates 'motorized' vehicle use, rather than enabling public transit or non-motorized' forms of transport like walking, bicycling. There is also limited understanding or consideration for assessing the impacts of the existing mobility patterns on land use alterations and vice versa and resulting urban spread. However, all indications are that being promoted are non-sustainable growth patterns.

There is an urgent to implement climate friendly and equitable urban mobility measures in the city. The office of *Friedrich Naumann Stiftung Pakistan* has initiated a three (3) year project **'Climate Efficient Urban Mobility and Smart City Growth'.** *Shehri-CBE* is the executing partner. This Strategy Paper is based on the number of consultations held and research conducted during the first year of the project.

The project team is engaging with critical stakeholders to stimulate debate and generate innovative solutions that actually get implemented, making our transportation services and infrastructure smarter and climate friendly (Section 5 of this Study documents the major objectives and recommendations coming out of the consultative sessions held this year). To achieve this, the project aims to develop collaborations between government and civil society, private sector stakeholders. Educational and informative publications are being brought out.

We are also confident that this project would go beyond just generating a discussion but would lead to actual implementation of specific measures for making our transportation services and infrastructure smarter and climate friendly.

Farhan Anwar
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Project Manager, Shehri-CBE

December, 2018

SECTION 1

Understanding Sustainable Urban Mobility

When we talk about Urban Mobility the context it provides blends a particular form of public transport - be it Light Rail Transit (LRT), Bus Rapid Transit (BRT), Subways, Metros or Non-motorized Transport (NMT) like walking and bicycling - into a larger understanding of urban mobility defined by parameters such as accessibility, affordability, reliability and associated environmental controls. This framework also looks at the impact of transportation interventions on the overall urban land use patterns within the city and how both aspects of urban growth can complement into making smart and sustainable cities.

We look into whether people including those with special needs can easily access and use public transportation options. Are the roads walkable? Are the road crossings safe? Are the transportation modes providing ease to people with special needs? Are the people well informed about the transportation systems being provided? Are the systems environmentally sound? Is a larger public transportation mode linked to feeder services? Is the use of non-motorized transport like bicycling being facilitated? And many more such checklists of questions. To accommodate all these considerations, a useful reference point is provided by the framework of **Sustainable Urban Mobility Plan (SUMPs),** published in 2013 through the efforts of the European Commission. SUMPs are designed to assist cities in making efficient and optimal use of existing transport infrastructure and services while at the same time allowing for a viable implementation of proposed measures.

"The understanding of sustainable urban mobility is rooted in the overall discourse on sustainable development. The Centre for Sustainable Transportation (CST) offers a comprehensive definition - a sustainable transportation system is one that accomplishes the following (CST 2002):

- Allows the basic needs of individuals and societies to be met safely and in a manner consistent with human and ecosystem health, and with equity within and between generations
- Is affordable, operates efficiently, offers choice of transport mode, supports a vibrant economy
- Limits emissions and waste within the planet's ability to absorb them, minimises consumption of non-renewable resources, limits consumption of non-renewable resources to the sustainable yield level, reuses and recycles its components, minimises the use of land and the production of noise." (GIZ, 2014).

Sustainable Urban Mobility Planning (SUMP) is a process that has now gained traction over the world with European cities taking a lead. Many cities in Asia are adapting to SUMP such as Shanghai, Seoul, Ho Chi Minh City, Singapore, Istanbul, Pune, and Bandung.

Recognizing the important role SUMP can play, the European Commission in its Action Plan on Urban Mobility of 2009 proposed to accelerate the take-up of Sustainable Urban Mobility Plans in Europe by providing guidance material, promoting best practice exchange, and supporting educational activities for urban mobility professionals. In June 2010, the **Council of the European Union** stated its support for "the development of Sustainable Urban Mobility Plans for cities and metropolitan areas [...] and encourage[d] the development of incentives, such as expert assistance and information exchange, for the creation of such plans." (European Union, 2013).

What is a Sustainable Urban Mobility Plan?

The Guidelines on Developing and Implementing a Sustainable Urban Mobility Plan (European Union, 2013) bring out well the core concepts, objectives and framework of the SUMP process. Some relevant text is shared here.

A SUMP is defined as "a strategic plan designed to satisfy the mobility needs of people and businesses in cities and their surroundings for a better quality of life. It builds on existing planning practices and takes due consideration of integration, participation, and evaluation principles." (European Union, 2013).

Traditional Transport Planning	Sustainable Urban Mobility Planning
Focus on traffic	Focus on people
Primary objectives: Traffic flow capacity and speed	Primary objectives: Accessibility and quality of life, as well as sustainability, economic viability, social equity, health and environmental quality
Modal-focused	Balanced development of all relevant transport modes and shift towards cleaner and more sustainable transport modes
Infrastructure focus	Integrated set of actions to achieve cost-effective solutions
Sectorial planning document	Sectorial planning document that is consistent and complementary to related policy areas (such as land use and spatial planning; social services; health; enforcement and policing; etc.)
Short and medium-term delivery plan	Short and medium-term delivery plan embedded in a long-term vision and strategy
Related to an administrative area	Related to a functioning area based on travel-to work patterns
Domain of traffic engineers	Interdisciplinary planning teams
Planning by experts	Planning with the involvement of stakeholders using a transparent and participatory approach
Limited impact assessment	Regular monitoring and evaluation of impacts to inform a structured learning and improvement process

Source: Rupprecht Consult, 2014 (as cited in European Union, 2013)

Objectives
A SUMP aims to create an urban transport system by addressing - as a minimum - the following objectives:

- Ensure all citizens are offered transport options that enable access to key destinations and services;
- Improve safety and security;
- Reduce air and noise pollution, greenhouse gas emissions and energy consumption;
- Improve the efficiency and cost-effectiveness of the transportation of persons and goods;
- Contribute to enhancing the attractiveness and quality of the urban environment and urban design for the benefits of citizens, the economy and society as a whole

Scope
The policies and measures defined in a Sustainable Urban Mobility Plan cover all modes and forms of transport in the entire urban agglomeration, including public and private, passenger and freight, motorized and non-motorized, moving and parking

Main Characteristics
A Sustainable Urban Mobility Plan tackles transport related problems in urban areas more efficiently. It is the result of a structured process that comprises status analysis, vision building, objective and target setting, policy and measure selection, active communication, monitoring and evaluation - and the identification of lessons learnt.

Building on existing practices and regulatory frameworks, the basic characteristics of a Sustainable Urban Mobility Plan are:

- Long-term vision and clear implementation plan;
- Participatory approach;
- Balanced and integrated development of all transport modes;
- Horizontal and vertical integration;
- Assessment of current and future performance;
- Regular monitoring, review and reporting;
- Consideration of external costs for all transport modes

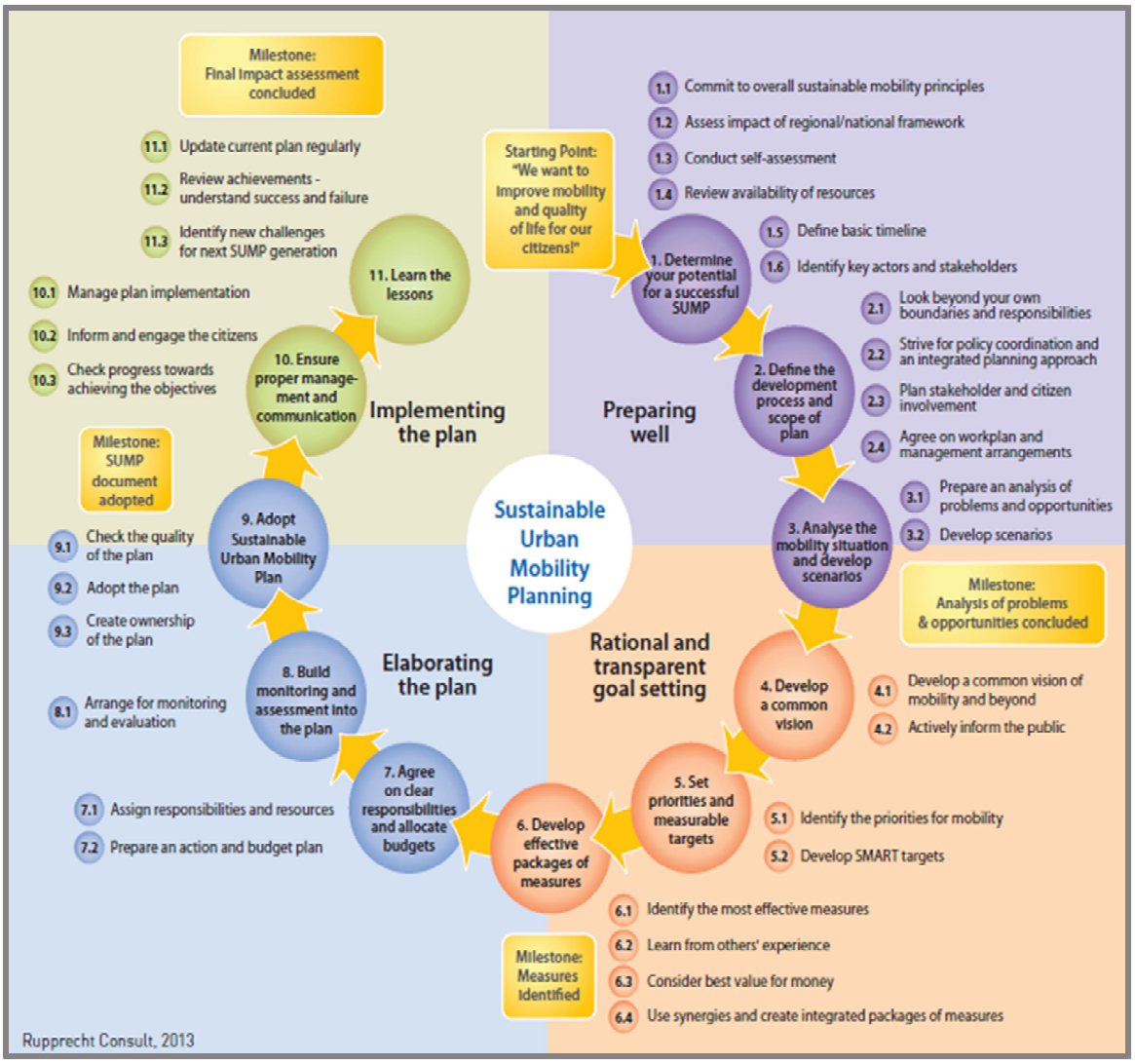
The critical process guidelines to be adhered during implementation of SUMP plans are described in the European Union planning frameworks (European Union, 2013) as follows:

a) **A participatory approach that involves citizens and stakeholders from the outset and throughout the planning process**

Involving citizens and other stakeholders is a basic principle to be followed. It is crucial to thoroughly plan the involvement. This requires consent why certain stakeholder groups should be involved

and what their influence could be. Following the actual stakeholder identification, a stakeholder coordination strategy should determine the how and when of the involvement. Through

PLANNING CYCLE FOR A SUSTAINABLE URBAN MOBILITY PLAN



an appropriate citizen and stakeholder involvement, decisions for or against specific urban mobility measures as well as the Sustainable Urban Mobility Plan itself can obtain a significant level of "public legitimacy".

b) A pledge for sustainability to balance economic development, social equity and environmental quality

A commitment to the principles of sustainability is essential. As sustainability is a complex concept, it is important to develop a joint understanding among the key stakeholders of what sustainability

and sustainable mobility means for a city and its surroundings. In developing a Sustainable Urban Mobility Plan, the view should be broadened beyond transport and mobility and appropriately consider social, economic, environmental, and political institutional criteria.

c) An integrated approach that considers practices and policies of different policy sectors, authority levels, and neighboring authorities

In many cases, plan development is driven by a city's mobility or transport department. However, the policy relevance of Sustainable Urban Mobility Plans is not limited to mobility and transport, and it is one of its characteristics to involve other municipal and regional departments (for example, land-use, environment, economic development, social inclusion, health, safety) in the planning process. It is a significant challenge to address deficits in integration and cooperation, but is also a main source for innovation and improvement.

d) A clear vision, objectives and a focus on achieving measurable targets that are embedded in an overall sustainable development strategy

The plan should be based on a long-term vision for transport and mobility development for the entire urban agglomeration. It should cover all modes and forms of transport: Public and private, passenger and freight, motorized and non-motorized, moving and parking. A strategic vision provides a qualitative description of a desired urban future and serves to guide the development of appropriate planning measures. The vision needs to be specified by concrete objectives, which indicate the type of change desired. Changes and impacts also need to be measurable requiring a well-thought-out set of targets that focus on selected areas and indicators

e) A review of transport costs and benefits, taking into account wider societal costs and benefits

Measure selection is guided not only by effectiveness but also by value for money, especially in times of tight budgets for urban transport and mobility, it is crucial to get the most impact possible for the resources spent. This requires a basic assessment of options with an eye on costs and benefits, including those that cannot be easily measured or valued such as those related to greenhouse gas emissions or air quality impacts. The European Commission emphasizes in its Transport White Paper (2011) the importance to proceed with the internalization of external costs for all modes of transport applying common principles while taking into account the specificity of each mode.

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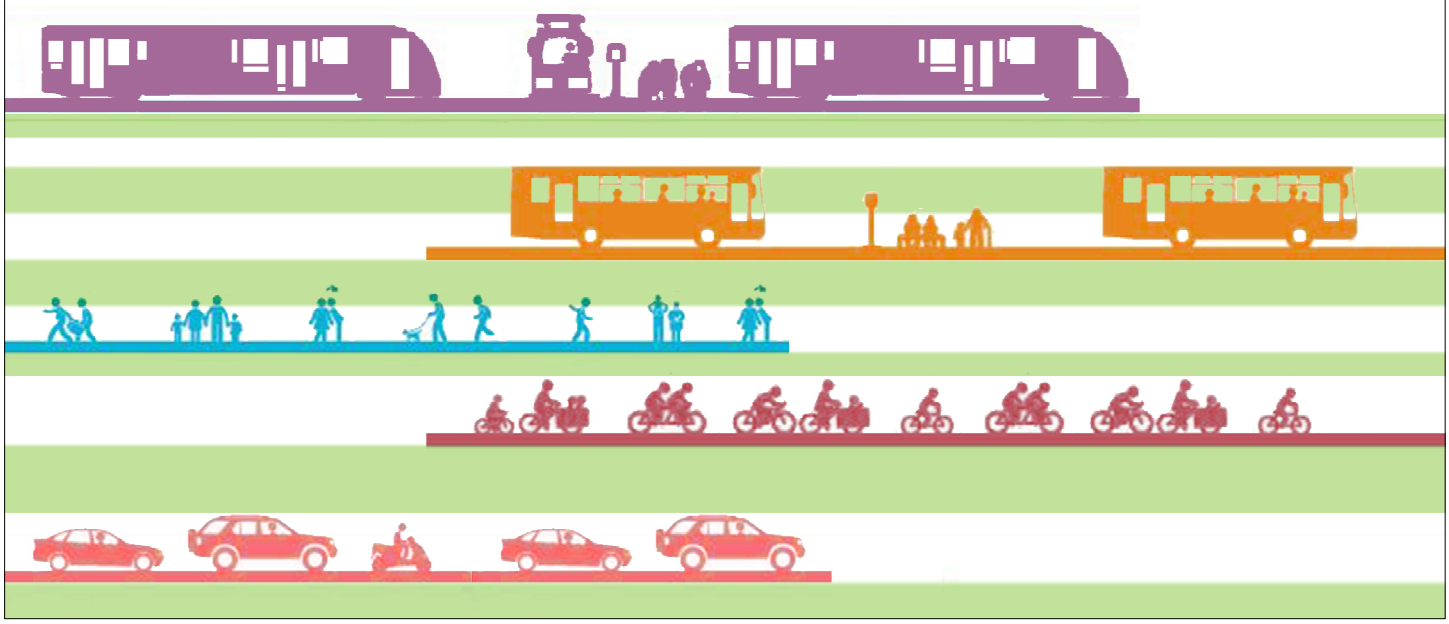
SECTION 2

Meeting Karachi's Transportation Needs
A Historical Progression



At the time of independence, Karachi had what the developed world is presently radically adopting in their urban mobility plans, namely, multimodal transit systems. There were 20 to 50 large buses operating (Hasan & Raza, 2015) along with a tram service which catered to a majority of its population's needs. The tramway connected the port to various important locations in the city including wholesale markets and the cantonment railway station (Hasan & Raza, 2015), integrating well within the city's geographical spread. At any given place, one was never more than 3 kilometers from the tramway. (Hasan & Raza, 2015). Inaugurated in 1885, the number of trams increased from 64 in 1954 to 157 in 1955 (Hasan & Raza, 2015), doubling in number within a period of one year. Additionally, around 30 taxis were also available along with some horse drawn carriages for the elite sections of the society. (Hasan & Raza, 2015). These well networked alternative transportation choices for moving around in the city besides ensuring high levels of accessibility also prevented the burden of ridership on any one particular mode.

Tram to Cantt Station, Karachi (circa 1950)
Source: Friday Times, 2014

In the years following independence, due to an influx of migrants from India who began settling on the fringes of the city, the government had to initiate additional transport services that operated beyond the dense urban centers. This transit demand was further exacerbated by the implementation of Greater Karachi Resettlement Plan by the government in 1959. The plan included creating two satellite towns, Landhi-Korangi and New Karachi, 20 kilometers from the city center to resettle the refugees from central Karachi. Envisioned to gradually transform into self-sufficient towns, it included provisions for employment through establishment of industrial and commercial activities. Unfortunately, due to various reasons, the industries were unable to materialize leading to deficiencies in employment. Consequently, transportation emerged as the most crucial challenge for the resettled population which had to commute 20 km daily to the city center for pursuing employment opportunities.

Beginning from Karachi Improvement Trust (KIT) in 1950, nine attempts have been made by successive governments to introduce bus systems to meet the mismanagement, and inefficient partnerships with private stakeholders. (Dawn, 2015).

Government-Sponsored Bus Related Initiatives

1950-1957: Karachi Improvement Trust formed for planning the expansion and management of the city post-independence. By 1957, it had proven inadequate to the task and was replaced by Karachi Transport Syndicate (KTS).

1957-1958: KTS was formed, and a fleet of 280 buses were launched in the city. A year later, KTS failed for financial reasons and was disbanded in December 1958.

1959-1967: To curb the transportation crisis resulting from the failure of Karachi Resettlement Plan, Karachi Road Transport Corporation (KRTC) was established as joint venture of government and public who were invited by shares. 324 buses including 24 double-deckers started operating. In 1964, KRTC was taken over by private groups and eventually collapsed in 1967 due to financial reasons.

1968-1977: Government initiated the Karachi Omnibus Service, a subsidiary of the West Pakistan Road Transport Corporation (PRTC). Over 600 buses were introduced. In 1973 when West Pakistan was subdivided into provinces, PRTC was converted into Sindh Road Transport Corporation (SRTC) for Sindh province and 2,000 buses were introduced under this body. SRTC losses continued to grow and was divided into Karachi Transport Corporation (KTC) for the city and SRTC for the rest of the province.

1977-1997: Under KTC, 550 large buses were introduced but in an episode of political violence that gripped Karachi during 1994-96, 24 buses were destroyed and 184 were irreparably damaged. KTC received no compensation and was running at a loss of Rs.10 million per month, with only 100 of its 303 buses operational. In 1997, KTC was privatized.

1997: Karachi Public Transport Society established by the government with invitation to public sector to invest in transport. 200 buses were purchased by a private investor and ran successful operations but the business dissolved after death. Currently, 150 of those buses are registered with the KPTS but only 100 are operative.

2002: Urban Transportation Scheme was introduced by city government, attracting investors to purchase buses. 364 large buses were introduced by 13 investors out of which the operation of 221 buses failed due to losses. Reasons for failure were collision of routes, competition in fares with the existing minibuses, and failure of the government to provide subsidies.

2009: CDGK initiated a CNG Green Bus Project under which operations of 75 buses were outsourced. Soon, the operating costs increased due to low bus fares and increased CNG cost given the fuel crisis. No investor showed interest in the project after the contract expired eventually leading to an abandonment of 75 buses.

Source: Hasan and Raza, 2015

In 1974, roughly three decades post-independence, Karachi's Tramway closed operations. The reasons provided were twofold: a) it was cordoning traffic on the main corridors of the city resulting in accidents, and b) it had to be demolished to make passageway for the main underground corridor of the metro being planned for the city, as part of Master Plan 1975-85. (Hasan & Raza, 2015). The closure of tramway marked the beginning of a downfall for the transport sector in Karachi which in the following years struggled with various governments' failed efforts at reviving similar light rail transit modes in the city.

Establishment and Demise of Karachi Circular Railway

While the metro system which intended to replace the tramway never materialized, the National Railway Authority constructed the Karachi Circular Railway in 1964. (Malm, 2015). Originally developed as a carrier for goods and extending to a full circle of 44 km to connect the four important industrial areas of the city (the port, the Sindh Industrial Trading Estate (SITE), the Central Business District (CBD) and the Landhi, the KCR by 1970 had started serving commuters as well. Its popularity with the public can be determined from the estimate that approximately six million passengers used this facility per year. (Hasan & Raza, 2015).

Source: Express Tribune

Unfortunately, by mid-1908s, due to general mismanagement as well as competition from the emergent bus networks, KCR started experiencing its downfall through reduction in services. By 1998, it was making only 12 trips a day full circle, as compared to 80 trips per day on only one of its routes in early 1980s. It closed operations in 1999. The primary reason provided for KCR's demise is that its reach became too limited for the expanding geographical area of Karachi, inclining people to shift towards other more well integrated modes of transport such as mini-buses and rickshaws. However, in reality, it was mismanagement, a general decline in the performance of Pakistan Railways, and influence from the informal transport operators within the city that served as the core reasons for a viable form of urban mobility dying out in Karachi. (Hasan & Raza, 2015).

Emergence of Minibuses

Most of the government transport initiatives up until 1971 served the populations living within the main city, largely neglecting the transport needs of marginalized populations settling on the city's peripheries. The first concentrated attempt to solve this issue was the introduction of Free Transport Policy by the government in 1971 under which anyone with the financial means to purchase a bus could apply for a route permit with the Regional Transport Authority (RTA) of Sindh. (Hasan & Raza, 2015).

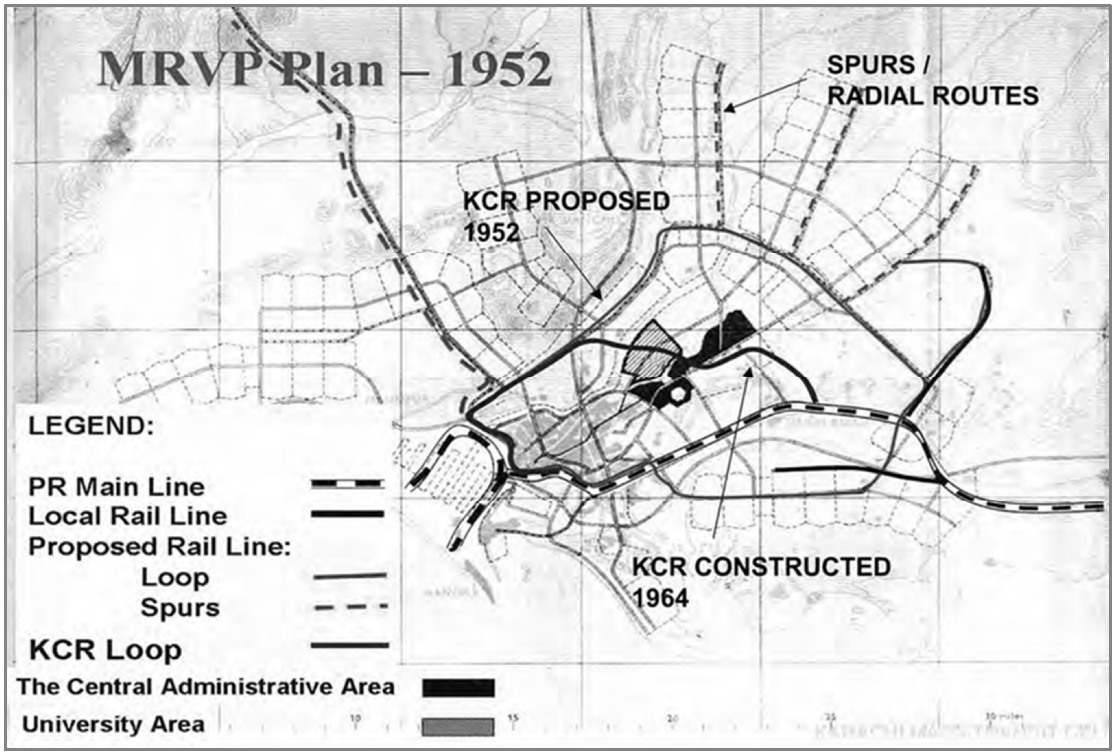
This policy paved way to the popular 'transport mafia' who lent out money to individuals of their own ethnicity (Pathan and Hazarwalla) for purchasing buses, creating an informal financing network between them. This transport mafia is also the reason behind Karachi's minibuses becoming predominantly associated with one ethnic group. Under this initiative, over 20,000 minibuses have been registered in Karachi over the years. (Hasan & Raza, 2015).

Introduction of CNG Rickshaws

In 2004, as part of President's Rozgar Scheme, CNG-fueled rickshaws were inducted into the market with funding from the federal government. This initiative was in line with the Supreme Court's ruling to convert all public transport to gas for reducing pollution. As of 2014, there were 60,000 rickshaws on Karachi's roads. (Hasan & Raza, 2015).

Attempts at Developing a Mass Transit System

1. **MRVP Plan (1952)**
   Prepared by a Swedish Company MRVP in 1952, this was the first master plan for Karachi that proposed a mass transit system including, the Karachi Circular Railway. (JICA, 2012). The KCR was constructed in 1964 and started operations in 1969.



JICA, 2012

2. **Karachi Development/Master Plan (1975-1985)**
   Prepared by Karachi Development Authority (KDA) in consultation with United Nations in 1954, the plan consisted of upgrading the existing Karachi Circular Railway and pushing it into the

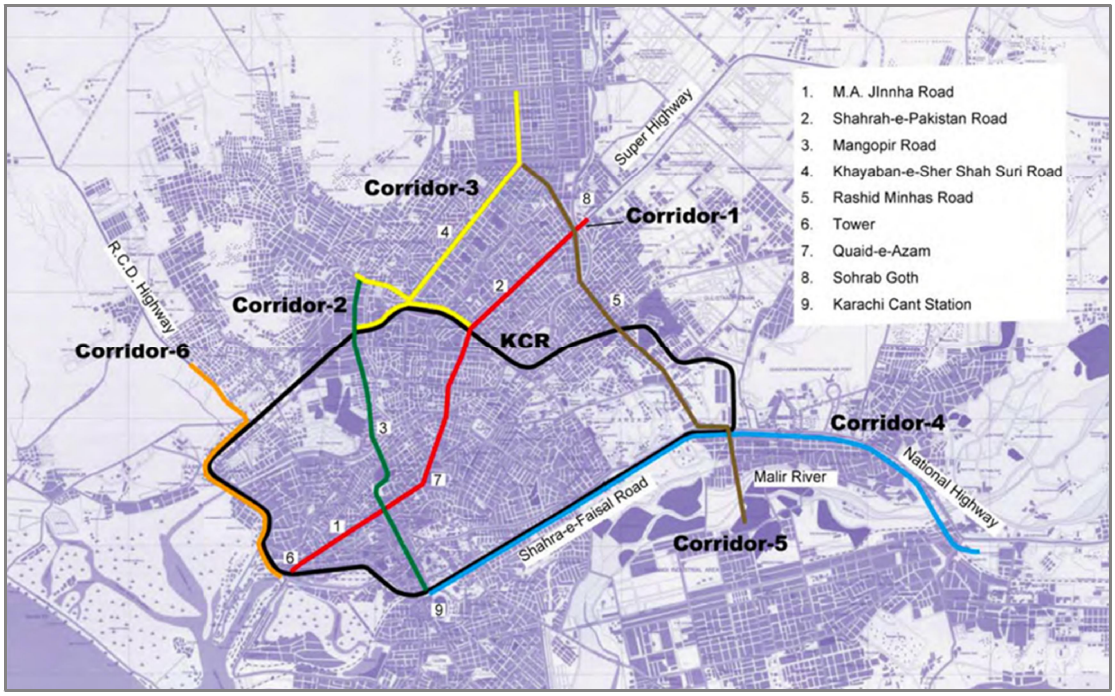
suburbs through a number of spurs. A partly underground (through the CBD and Old City), partly elevated and partly at-grade metro was to bisect the circle of the Circular Railway. (Hasan & Raza, 2015).

Despite the availability of government funds, the plan did not get come through owing to the political conflict of 1977 which led to the dismissal of the Bhutto government whose plan this was. The subsequent military government abandoned the scheme. (Hasan & Raza, 2015).

3. Karachi Mass Transit Study (1990)

As part of the Karachi Development Plan 2000, a Karachi Mass Transit Study (KMTS) was undertaken with the help of World Bank during 1987-90. The study established that for both economic and technical reasons, a light rail system was not feasible for Karachi, and buses had the necessary capacity to meet the transport needs of the city. (Hasan & Raza, 2015).

Thus, alternatively, six bus transit-ways in the total length of 87km including elevated sections were proposed. (JICA, 2012). A Priority Corridor 1 was identified from Sohrab to Tower passing through Karachi's various heritage buildings in the old city but in 1994 objections were raised by civil society actors on the heritage-related environmental damage the transit corridor would cause. (Hasan & Raza, 2012). Later, the conceptual design changed from busway to railway by politicians and the tender on BOT was floated but no bidders showed interest, leading to an overall dissolution of the master plan. (Hasan, 2015).



Arif Hasan, 2012

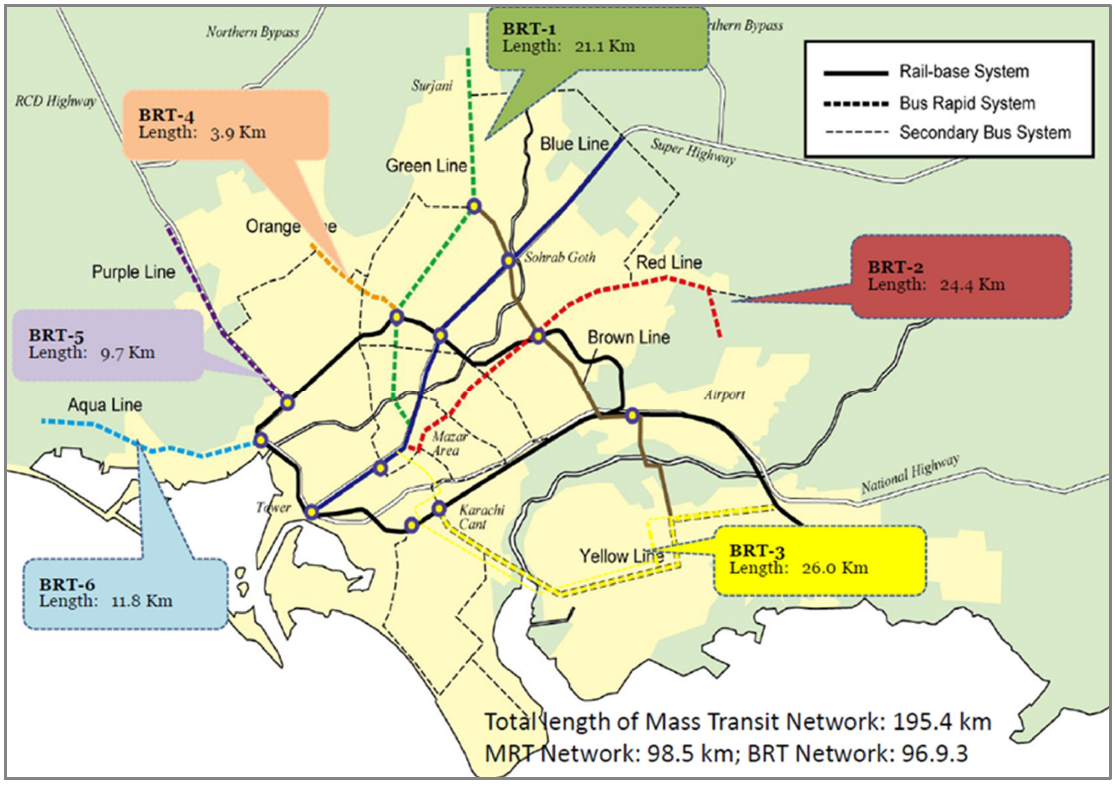
4. Karachi Strategic Development Plan 2020 - Transport Sector Report

A comprehensive report on Karachi's transport was included in the Karachi Strategic Development Plan 2020 which proposed the construction of three circular routes in addition to KCR, and another big loop line outside the urbanized area connecting Keamari and Bin Qasim passing through Gadap. The intent behind these recommendations was to extend services to sub-urban areas for maximum coverage and utilities. (JICA, 2012).

5. Karachi Urban Transport Master Plan (KUTMP) 2030

This plan was informed by the findings of the Karachi Transportation Improvement Project (KTIP) undertaken by JICA from 2009-2012. It included the construction of six BRT corridors and a plan for revival of KCR including a rail corridor bifurcating the circle of the KCR and extending it to the Super Highway, the main exit of Karachi to the rest of the country. (URC). It was predicted that the KCR would serve 0.7 million people per day. However, work on KCR was delayed because of administrative and institutional factors, lack of political will, and the absence of a restatement policy for 23000 *katchi abadis* dwellers that would have faced dislocation as a result of this project.

KARACHI TRANSPORT IMPROVEMENT PLAN 2030



Source: Public Private Partnership Unit, Government of Sindh

Market Response (Informal - Private/Para-Transit Alternatives)

1. Qinqis

In the absence of adequate public transport networks, the local establishments innovated and acquired informal modes of transit on their own that found a captive market. Introduced in 2002, qingqi was one such market response. A hybrid of rickshaws and motorbikes, these are Chinese motorcycles manufactured in Pakistan attached to six-seater carriages at their hind, resembling the design of a tanga (six-seater horse-carriage) popularly used in some parts of the country before and up until few years after the independence. By 2015, their numbers soared to over more than 40,000 (Hasan & Raza, 2015) diminishing the dominance of minibuses to some extent.

Although to begin with they were running in the absence of legal registration and sanctioning of routes by the Regional Transport Authority (RTA), the operations of this transit mode were quite systematic. The Karachi Qingqi Welfare Association with which all qingqis are registered, is responsible for allocating its routes, fares, and stands, recording data of its drivers, maintaining complaint procedure and action system for ensuring rights of drivers and passengers, as well as dealing with the local police and transport mafia in case of conflicts.

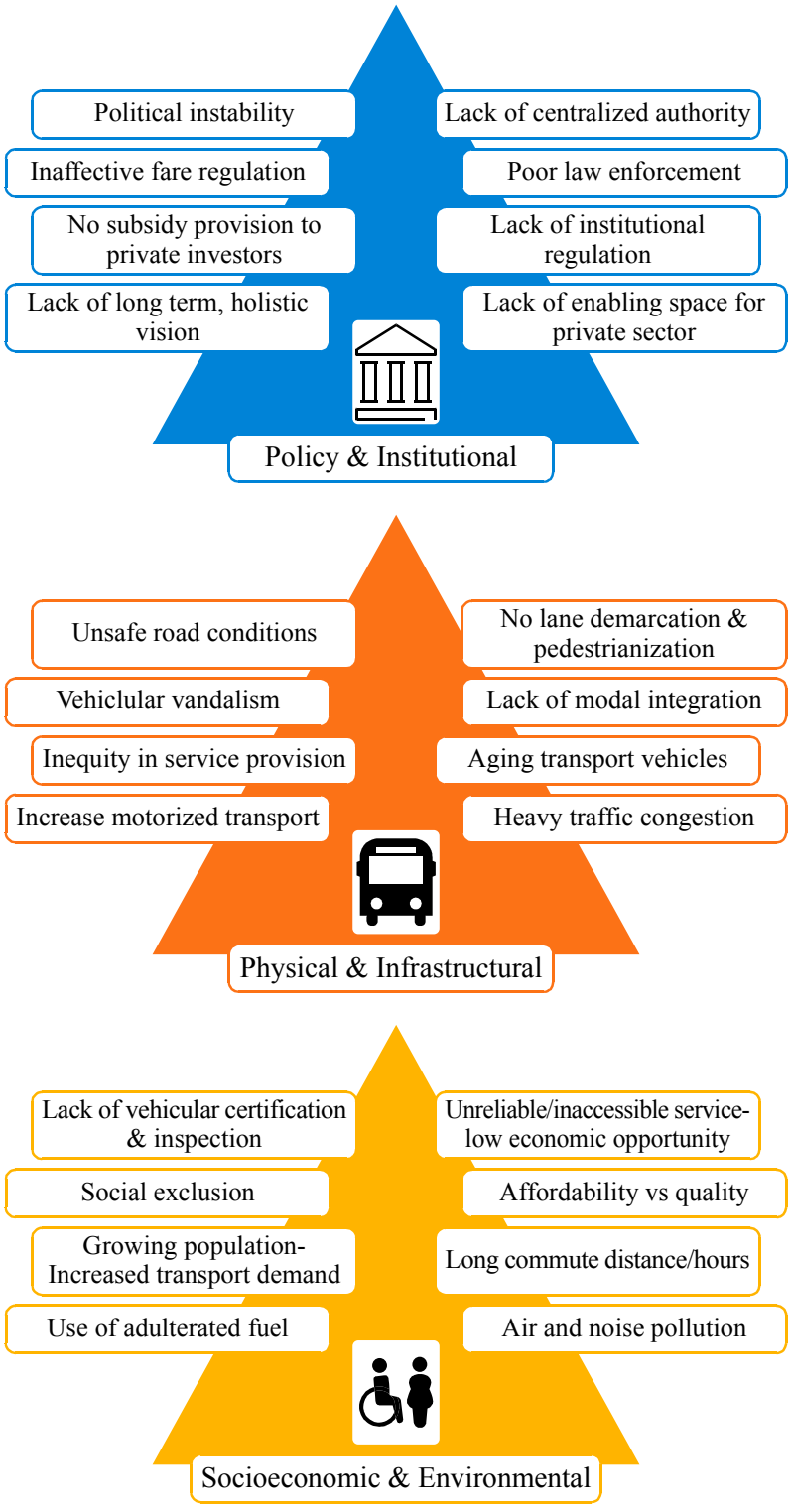
2. Motorbikes

The motorbike, although private and costly, is another popular mode of transit in the city particularly for the lower and middle-class populations. Registered at an average rate of 1500 per day, the number of motorbikes rose from 500,000 in 2004 to 1.65 million in 2013. (Hasan, 2015). In addition to contributing to air and noise pollution, their alarming increase causes heavy traffic congestion on the roads. Nevertheless, this mode of transit has found mass ridership in the city for obvious reasons.

3. Ride-hailing Services

In 2016, international ridesharing services Careem and Uber entered the transport sector overcoming the huge transport demand posed by the middle and upper-income class populations. With their fair, efficient, and reliable digitalized services along with proper safety standards, these ride-hailing companies provided the population an affordable, accessible, and socially acceptable alternative to travelling in rickshaws and white cabs. Bykea, a home-grown innovative market response to the public's increasing transport demand, also entered the private transport market recently. Replicating the ride-hailing model of Uber and Careem, it uses motorbikes to provide on-demand transport service to the public. These ride-hailing services recently faced a threat of closure and ban of services from the government on grounds of illegality, having not obtained route permits for their vehicles.

The diagram below provides a succinct overview of the most persistent problems prevalent in Karachi's transport sector to this day.



It was objected that they were violating provisions of the Sindh Motor Vehicle Tax Act, 1958, the Motor Vehicle Rules, 1959, and the Motor Vehicle Ordinance, 1965, which specifically provide that no non-commercial vehicle could be used for commercial purposes. (Tunio, 2018). However, these were soon resolved in 2017 when an agreement was reached between these companies and provincial transport department wherein commercial permits were issued under the Motor Vehicle Ordinance. (Tunio, 2018).

Historical (De) Progression

Karachi's transport sector has witnessed a historical de-progression since its independence in 1947. Instead of moving towards more versatile and sustainable forms of public transportation, we have gone from having an efficient rail-based system to large buses and minibuses to ultimately an alarming reliance on motorbikes and automobiles. This has negatively affected the rapid urban growth and poorly shaped the urban form of the city as well. Evidently, while efforts were made by successive governments to maintain, expand, and revive previously successful means of transit such as tramway and railway, these were mostly in vain due to political interests and instabilities, weak institutional mechanisms and governance structures, siloed approach towards transport development, and improper urban design and land planning among various other factors. All of this has resulted in a dysfunctional and fragmented construct of governance.

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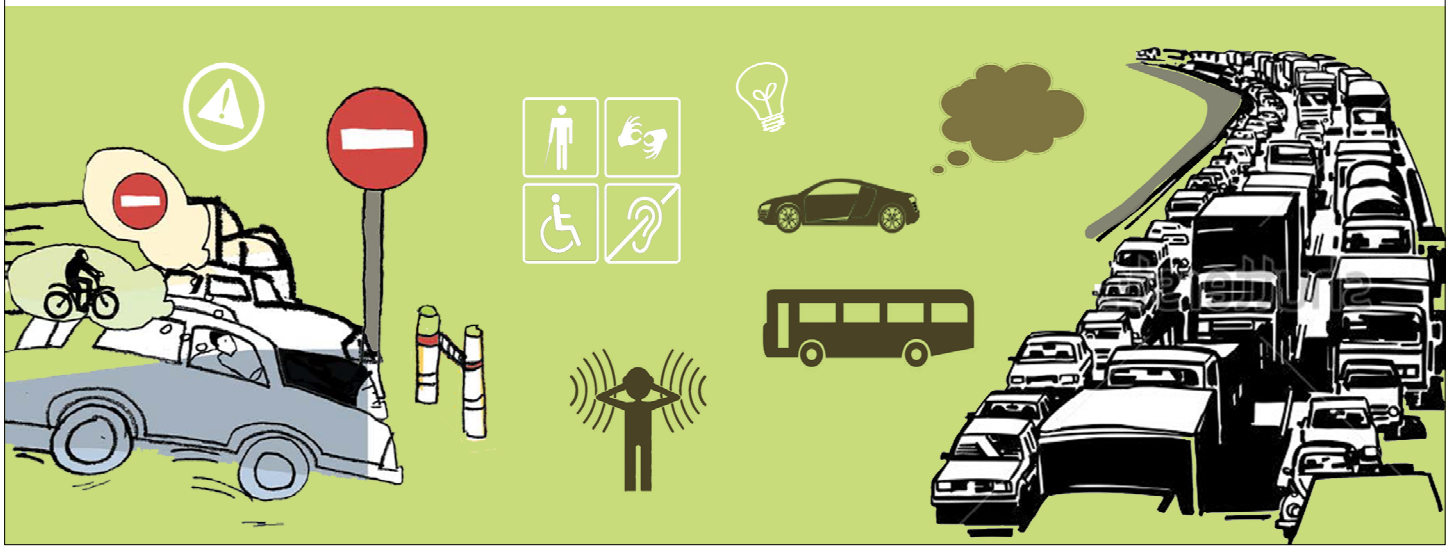
SECTION 3

Ensuring Sustainable Urban Mobility
Karachi's Present Day Challenges

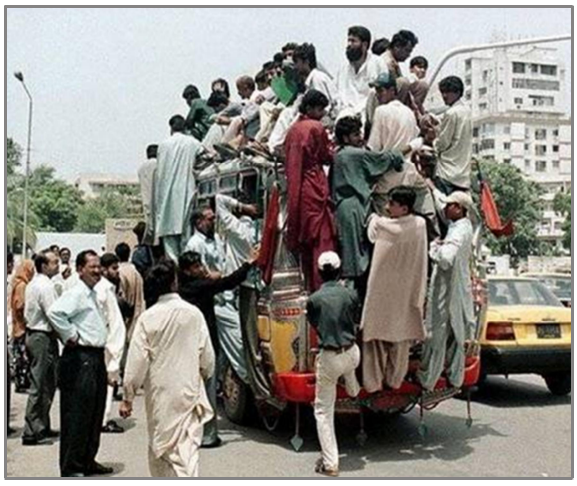


The existing urban mobility scenario in Karachi is far from being sustainable. There exists no viable public mass transit system in what is the sixth largest city in the world. Critical parameters of sustainability such as ensuring accessibility that includes universal access, affordability, facilitation of non-motorized transport, environmental controls are notable by their absence. Relevant policies, strategies, standards and institutional frameworks that may include urban mobility/transportation policy, street design guidelines have not been enacted. There is no centralized authority looking after the mobility needs of the city and the institutional construct is decentralized within the different tiers of governance - federal, provincial, city without having any mechanism for coordination or creating of synergies.

This *Section* looks into some critical mobility-related challenges and their implications with a particular focus on issues of sustainability and related interfaces with policy and governance.

A Profile in Inequity

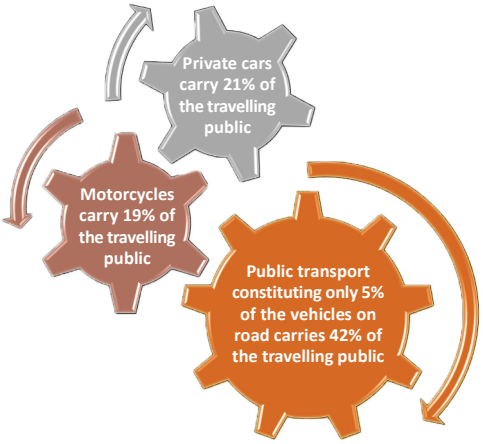
While the sector is facing numerous challenges, the most disturbing manifestation of the inherent system inadequacies is how the mobility options of the common man, the pedestrian, those using public transport are being constrained, with resulting adverse impacts on their lives. A recent *Study* conducted by the *World Bank* brings out the crisis in urban transport and mobility well in statistical details that also helps in highlighting the inequitable and non-inclusive nature of the existing priorities in policy and planning. It states that



Source: Karachi Urban Transport

"The city has approximately 10,000 kilometers of roads, with local roads accounting for 93 percent and highways and arterial roads for less than 5 percent of the total length. Karachi has also six arterial or trunk roads that extend radially from the central area. There are nearly 13.5 million mechanized trips made each day within the city, of which about 42 percent are made by public and 58 percent by private transport. There were 3.6 million registered vehicles in Karachi as of mid-2015 (over 30 percent of the national total), and private vehicles-mainly motorcycles and cars-constitute about 84 percent of total registered vehicles, while public transport accounts for 4.5 percent of the total registered vehicles. The number of passengers competing for a single bus seat in Karachi is 45, which is one of the highest in the world. In comparison, 12 people compete for a single bus seat in Mumbai, and only 8 in Hong Kong, China. Trips made by private vehicles (motorcycles, cars, and so forth) account for 53 percent of the total mechanized trips being generated. At the same time, the average volume-to-capacity road traffic ratio is 1.1, which indicates that on average, 110 percent of the total capacity of the roads is utilized (that is, slightly exceeding their capacity). In short, the majority of trips are made via private vehicle, and

the roads are overcrowded. Of all trips (both mechanized and non-mechanized), walking is the most predominant form of travel, with 46 percent of trips made by foot, compared to 11 percent by cars. With growth rates for private vehicles at over 4 percent, there are now over 1,000 new vehicles added to the streets of the city each day. Buses, minibuses, coaches, and vans are the major transport modes in Karachi. There are over 12,000 buses, minibuses, and coaches plying on 267 routes in the city. The bus fleet has been decreasing in size without any other mode to adequately replace it. The number of minibuses has declined from around 22,000 in 2010-11 to the current total of around 9,500." (World Bank, 2018).



All these statistics reflect an 'unfair' urban mobility scenario. This non-inclusive and dysfunctional nature of the existing system also has a direct bearing on the lives of the people in terms of the related socio-economic and environmental implications. A local *NGO, Urban Resource Center (URC)* recently did a Study that focused on developing this link between the non-inclusive transport system and urban poverty. The *Study* drew on low-income groups in Karachi by conducting interviews with 108 transport users living in one central and four peripheral neighborhoods of the city. The *Study* with relevance to the issue of affordability notes that "despite regulation, the amount presently spent on transport is a substantial burden on the budgets of low-income households. Increases in fares occur unpredictably, causing hardships and frustration to all salaried workers in the city. The monthly incomes for most of the people interviewed were broadly between Rs.1,500 and Rs.6,000. Fifty one per cent of respondents were found to be spending 10 per cent or more of their income on transport. Average expenditure on transport was Rs.325 a month, with about 70 per cent of respondents spending between Rs.200 and Rs.400. Sixty-five per cent of respondents spend more than two hours each day going to and from work while 15 per cent spend more than four hours daily." (Urban Resource Centre, 2001).

In terms of access, the aspect of inadequate coverage was identified. The survey findings revealed that "many places are not served by any routes at all, whilst in other places the nearest available stop is a long walk away. The limited availability of connections necessitates long out-of-the way trips to catch a vehicle. One-third of interviewees reported that it took them between 16 and 45 minutes to reach the bus stop." (Urban Resource Centre, 2001).

We continue to invest in private automobile friendly infrastructure

The government's response to traffic congestion has been to build signal-free roads and flyovers wherever traffic congestion takes place. Between 1993 and 1999, the government built only six flyovers. However, since decentralization was instituted in 2001, the elected government and the present province control system have built 37 flyovers 34 and six signal-free roads. At non-rush hours, they have reduced travel time, but during rush hours exit points are clogged.

Source: Hasan & Raza, 2015

Quality of service and safety came out as major areas of concern. It was found that "speeding and unsafe overtaking and driving are the cause of many accidents, while poor mechanical maintenance such as worn out brakes also threatens passenger safety. Many people are injured or killed due to the practice of travelling while hanging on doorways or ladders, or sitting on roof tops (the result of peak-hour crisis situations described earlier). The unsafe manner in which passengers are picked up and dropped off is another frequent cause of injuries, accidents and even deaths. Long driving hours reduces the ability of the drivers to avoid accidents. An estimated 30 people die in various accidents in the city each month and 100 are seriously injured." (Urban Resource Centre, 2001).

Non-affordable fares, time lost in commute that could have been spent in more productive gains elsewhere and health and safety issues all have relevance to increased poverty and heightened social and psychological stresses.

Source: Pakistan Defence Forum

Gender

Even within the marginalized, certain stakeholders suffer more as a consequence of the inadequacy of public transport that include women and the differently abled. A recently conducted Doctoral Research (Malm, 2015) work discusses interesting interfaces between the changing mobility scenarios in Karachi and the various planning interventions made over the years. It notes that "transport demand greatly differs if you are rich, poor or a women, child or man. Regarding the gender context, it documents that 'women account for 25% of the total travels in today's Karachi (Hasan and Raza, 2011). Many of these are women from the middle class or above since many of the women in poorer communities work from home, or work in the house. However, there is an increasing number of (poor) women that need to travel due to work and education. Many work as domestic help in the richer areas, but as there are no public transport to these areas it causes large problems.

These women can spend as much as 20 to 40 percent of their income on transport, as well as three to five hours of commuting every day (URC, N.b). They are also experiencing large discomfort on public buses due to harassment from both drivers and other passengers and the solutions suggested are more reserved seats and separate compartments for female passengers of busses (Hasan, 2015). In Lahore the pink rickshaw recently premiered, where both driver and passengers are female (Bukhari, 2015). In a study on motorcycles around one third of the respondents agreed that women should be able to ride motorbikes, considering the fact that there are almost no female motorbike drivers in Karachi today, this gives a suggestion that female ridership might go up in the coming years (Hasan and Raza, 2011). As a second note, the introduction of QINGQIS and rickshaws has also promoted women ridership as it is considered a safer mode of transport for women as they don't have to be mixed with men (Ajaz, 2013)."

Rising atmospheric pollution

Source: Dawn Group

A *JICA (Japanese International Cooperation Agency) Study* generated some primary data that indicates that one of the primary sources of air pollution in Karachi is the transport sector. The *Study* notes, "within this sector, the use of the operation of defective vehicles, use of poor-quality fuel, and increase in the number of vehicles beyond the capacity of roads, especially center of the city, contributes significantly to the deteriorating air quality. Noise pollution from vehicles is also serious problem in Karachi city, especially in residential areas.

Major contributors to the noise pollution are use of vehicle horns, removal of silencers on rickshaws and motorcycles, high volumes of traffic especially heavy vehicle and poorly maintained motor engines. The concentration of Air pollution, NO?, CO and PM10, and noise pollution levels along road sides and at intersections in Karachi city exceed the limits recommended by National Environmental Quality Standard (NEQS) of Pakistan. The Vehicular Emission Control Program (VECOP) was carried out in Karachi city in collaboration between Traffic Police and Government of Sindh to make drivers and owners their vehicles environment friendly. In this program, traffic police would check and monitor the smoke emitting and noisy vehicles at the busy location. According to the result of this monitoring, approximately 30% of checked vehicles were found emitting smoke and noise above the limits prescribed by NEQS." (JICA, 2012).

A Research Paper[1] done at the Karachi University that was a GIS based study shows that concentration of CO in the ambient air on the busy roads is very high and almost the entire pollution in the environment is being generated by the automobile exhaust. Growing number of vehicles using leaded petrol, gasoline, poor condition and maintenance of vehicles use and defective silencers are major causes of high concentration of CO in the environment of Karachi.

Non-Motorized Transport Issues in Karachi - Walkways obstructions

Street vendor obstacles
As a center of economic activities in Karachi, a lot of street vendors are found in the downtown area. Many of them use sidewalk and traffic lane to place their stalls. Although they can be seen as obstacles to pedestrian, their existence also generates pedestrian activities in the area. Thus, the correct solution for street vendors is to manage them, not eliminate

Store's spillover
Many shops use sidewalk as their extension to showcase their products. They do not fully block the sidewalk because they also want pedestrian to be able to access their shops easily but this practice interrupt pedestrian convenience.

Poor sidewalk condition
Many sidewalks are heavily damaged or even left without any pavement. There are also problem of uncovered drainage. All of these trip hazards raise safety issues to pedestrian. Cleanliness also a problem in pedestrian infrastructure. Garbage are often found in sidewalk.

Missing and discontinuous walkways
Many streets have no sidewalk. On some narrow streets where it does not need any exclusive sidewalk, pedestrians sometimes still need to give priority to motorized vehicles. Sidewalk design in Karachi still emphasized on car priority. It disappears at every driveways and intersections.

Parking on sidewalks
A huge number of motorcycles occupy the sidewalk for parking in downtown Karachi. Some are illegal parking, some are even managed by official parking attendants

Source: ITDP, 2015

[1] Investigation of Carbon Monoxide at Heavy Traffic Intersections of Karachi using GIS to Evaluate Potential Risk Areas for Respiratory and Heart Diseases, 2010, Karachi University

Public Transport Modes

Public transport modes in Karachi can be categorized into three groups:

- Railway (Pakistan Railways)
- Public Bus (Minibus, Coach, Large Bus)
- Contract Carriage (Company bus, school bus)
- Para-transit (Rickshaw, Suzuki Carrier, Qingqis)

Railway
Presently, passenger trains are operated by Pakistan Railways (PR) for inter-city services only. PR is a state-owned railway service company under the Ministry of Railways of the GOP. The track of the inter-city railway runs parallel with the important east-west corridor along Shahrah-e-Faisal Avenue. The route is called as "Main Line". There were 18 trains departing and arriving Karachi Cant Station a day with 24,000 passengers, according to JICA 2008 survey. The number of trains dropped to 15 in 2010, and the daily number of passengers was estimated at 17,000 in the Cordon Line Survey in KTIP
Study. Trains seldom arrive on schedule.

Bus
The bus is the major transport mode in Karachi. Minibus is the popular bus with a rich decoration and roof seats. The usage of roof seats is prohibited in principal but the seats are commonly used by many passengers because of insufficient bus capacity. There are approximately 10,000 minibuses in Karachi. It should be noted that the number of bus fleet has been decreasing while the population is increasing and the city is apparently expanding. Large-scale companies usually operate contract buses for the pick and drop of their workers, which is reflected the poor services of public transport system in terms of quantity and quality.

Para-transit
The Rickshaw (Auto Rickshaw) is a popular transport mode in Karachi, which supplements the insufficient bus network. Rickshaws with two-stroke engine have been blamed for serious environmental damages such as air pollution and noise. The government of Sindh urges conversion of rickshaws from two-stroke engine of gasoline to four-stroke engine of CNG. There are many new rickshaws with CNG four-stroke engine observed on the roads in Karachi, although there still remain a lot of rickshaws with two-stroke engine.

Qingqi Rickshaw is similar to Auto Rickshaw, having three wheels and passenger sheets in the rear. Qingqi Rickshaws are mostly operated in local streets as a feeder service of bus network and operation along main roads are restrained. The Suzuki carrier is a kind of taxi with 10 seats in the rear of a pick-up truck. It also provides supplemental service of public transport.

Source: JICA, 2012

Fragmented policy, planning and institutional construct

Roles, responsibilities and functions are segregated with overlaps that create further complications. As documented in the World Bank Study (2001), The *Karachi Metropolitan Corporation (KMC)* is responsible for the administration of over 40 percent of roads in the *city*. The *Transport and Mass Transit Department* is the principal planning, regulatory, and implementing body of *Government of Sindh (GoS)* responsible for dealing with all urban transport matters at the provincial level. Currently, responsibilities for major roads transport and traffic management within the city are shared between two departments of the *KMC-Work and Services* as well as

Transport and Communications. Fares for public transport are regulated by the *GoS Transport and Mass Transit Department*. The *District Regional Transport Authority (DRTA)* issues route permission for public transport in Karachi. However, the decision making for the permission is governed by a board, with representation from the police, city government, and *Provincial Transport Authority* and *DRTA*. The *Public-Private Partnership (PPP)* unit of the *GoS* is also assisting the *Transport and Mass Transport Department* in the development of mass transit initiatives in Karachi.

This disconnect in the governance setup will be elaborated upon further in the section on the Karachi BRT. This situation, unfortunately, is of long standing. The dysfunctional governance set up, other than constraining efficiency of government bodies, also has severely limited possibilities of leveraging private expertize and financing by experimenting with models of *Public Private Partnerships (PPP).* The *Study for Karachi Transportation Improvement Project,* conducted by JICA (2012), while identifying reasons for failures of implementing public mass transit projects and attracting private sector interests, lists the following reasons:

- Lack of access to long-term debt, domestic and international
- Absence of cohesive government policies
- Absence of a credible legal and regulatory framework
- Absence of a credible institutional and administrative framework
- Absence of a clear government commitment to conclude the PPP deals in a reasonable time
- Inherent risks in investment in railways, particularly, mass transit systems
- Lack of experience in PPP projects in both public and private sectors

The *JICA Study* goes on to identify similar gaps and lack of a clear focus in the latest city-wide planning document - *Karachi Strategic Development Plan 2020*. The *Study* states, "in an urban transport plan, its projects and programs should be well organized under a clear structure of public statements such as strategy, object, policy, and so on. The typical structure in a transport plan is such as goals - objectives - policies. In some cases, the word of "vision" and "strategy" are used. This kind of planning structure is not clear in the transport sector in *KSDP 2020*. There are 16 objectives, three principles, and some recommendations, but they are only a mixture of public statements of various level. It is necessary to establish the policy structure for the transport plan in Karachi." (JICA, 2012).

This confusion is symptomatic of one, the lack of adequate jurisdiction that KMC enjoys when it comes to transport sector planning and secondly, the general absence of a centralized vision or policy and institutional structure for the sector.

Connecting the dots - Sector based challenges in Karachi

As is now evident, the sector is faced with challenges in sustainability at all levels of service delivery and any specific challenge can neither be studied nor resolved in isolation. Two recent studies -one by the World Bank and the other by JICA - have tried to 'connect the dots' and spell out the sector challenges within a holistic context.

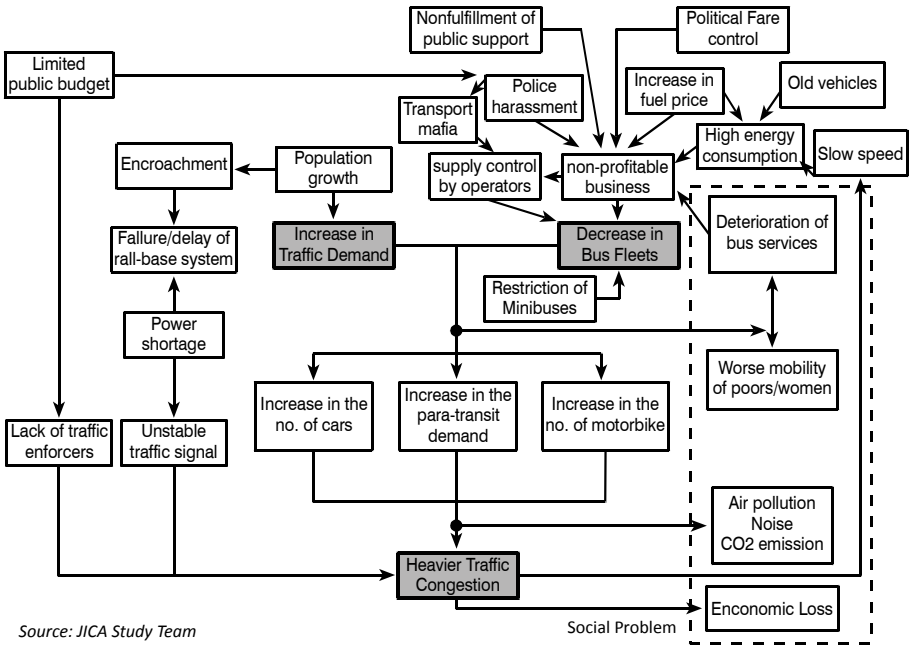
The World Bank (2001) *study*, lists out the following key challenges:

Complex institutional and organizational structure. The urban transport sector in Karachi faces a typical administrative problem between a strong megacity and its higher state government. The complex relation between the city government and GoS is one of the reasons for the slow implementation of BRT projects

Low capacity of bus service. Most megacities in developing countries suffer from a large number of small buses (minibuses) that cause serious congestion in the city centers, especially in the absence of a mass transit system. Usually, the introduction of a mass transit system can be justified from the huge demand for public transport in these cities. However, public transport in Karachi is fast deteriorating, with the number of buses decreasing and traffic demand increasing with rapid population growth, city expansion, and economic growth. Currently, there is a shortage of close to 8,000 buses, which will just cover the immediate demand

Improper bus routes and poor road networks. The majority of the bus services concentrate on radial directions, and there is no route hierarchy in the bus network or the trunk and feeder system. Most of the local road network is not in a good condition, especially in more populated districts and poor neighborhoods. *Traffic congestion*. Traffic congestion is a serious problem, especially in the center of the city. A lot of traffic signals are installed at intersections in the central city area compared to the suburban area. However, in peak hours police control traffic because of the problems of the signalized intersections

Lack of parking spaces. While common to many large cities, for Karachi this is a major issue. The capacity of public parking is very small compared to the demand. In most of the commercial areas,



Problem Structure of Transport Sector in Karachi

parking spaces are also heavily encroached upon by vendor carts and stalls. Double parking and illegal parking are common in the main business districts, which causes serious traffic congestion

The JICA (2012) *Study* focuses on a finding that the number of bus fleets in Karachi are reducing in numbers and then connects well analytically this 'problem' with a variety of sector-based causes.

The *Study* notes that "the limited budget of public sector is one of the major reasons of the urban transport problems. Bus operators cannot get enough support from the Government. Sometimes they face police harassment which makes them to rely on transport mafia. The bus fare is controlled by the government at low level, while bus operating cost is increasing due to increase in fuel price and poor fuel efficiency of decrepit vehicles. These factors make the bus operation to be non-profitable business, which results in the decrease in the number of bus fleets. The government restriction on new minibuses is also an important factor for the decrease in buses.

On the other hand, traffic demand continues to increase according to the population growth in Karachi. The population growth brings about encroachment which threatens the transport sector development. It also increases the demand in power sector, which causes power shortage and results in the unstable condition of traffic signal. The large gap between demand and supply causes the demand shift from buses to rickshaws and Suzuki pickups, and the increase in the number of private cars and motorbikes. From this, traffic congestion becomes heavy in Karachi, which brings about environmental problems and a large scale of economic loss. The traffic congestion causes low fuel efficiency which is again the cause of poor public transport system in Karachi." (JICA, 2012).

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SECTION 4

Karachi's Bus Rapid Transit Project
Opportunities and Challenges

Many developing cities suffer from inadequate, unsafe, and unreliable transit services either due to a lack of financial resources, operational or institutional control or general mismanagement. This failure translates into restricted mobility options for the public and impacts their citizenship experience through limited access to civic services and socio-economic opportunities causing social exclusion and increased financial stress. In a larger context, adversely impacted is the overall urban growth and sustainable socio-economic development of the city.

Since the mid 70's, planners and policy makers in Karachi have toyed with a number of public mass transit options, ranging from LRT to BRT, and revival of the KCR. However, till the initiation of the Karachi BRT project in the year 2016, there had been nothing to show on ground for the number of studies and plans that got developed. The selection of BRT as the chosen mass transit option for the city has been influenced by considerations of both time and finances. BRT as compared to other options such as LRT and subway is cheaper, easier to implement and takes lesser time to be operationalized.

Besides Latin American cities of Bogota, Curitiba, and Quito (Ecuador) which are the catalytic examples of BRT, the systems in Brisbane (Australia), and Ottawa (Canada), are much notable for their sophistication, followed by Taipei (Taiwan), Nagoya (Japan), and Jakarta (Indonesia) in Asia.

Source: Wright, 2003

It would be instructive at this stage, when the Karachi BRT has started to take shape, to compare the policy, planning, socio-economic and institutional framework that has been structured for the Trans Karachi Breeze BRT project with a successful BRT case study that also finds a relevance to our context. Two cities come to mind - Curitiba in Brazil and Bogota in Columbia. Like Karachi, both Curitiba and Bogota initially aspired to constructing metro-based systems but due to financial constraints switched to Bus Rapid Transit (BRT), a popular alternative to LRT. While Curitiba's 'surface subway' was the first attempt at introducing a holistic BRT system in the world, it is Bogota's TransMilenio that transformed the perception of BRT around the world (Wright, 2003) and to this day is "heralded as a model for effectively moving a developing country city's transportation system toward sustainability." (Bus Rapid Transit Project, n.d.).

As such, a comparative analysis with the TransMilenio project can be useful, on how the two separate BRT systems - TransMilenio of Bogota and Trans Karachi Breeze have envisioned and structured their projects. This comparison would help in determining if we in Karachi are moving on a path that could lead to a viable and functional public mass transit system operating in the city or have we already derailed ourselves and are heading for a disaster.

TransMilenio, Bogota and Trans Karachi Breeze - A Comparative Analysis

Before the introduction of TransMilenio, Bogota in many ways was similar to present-day Karachi, facing challenges of overpopulation, financial deficit, weak institutional capacity, monopolization of informal services, crime, congestion, urban degeneration and poverty, among many others. Characterized by a rapidly growing urban population, the city also witnessed the migration of a large population from the rural areas (Kooshian, Turner, & Winkelman, 2012) overburdening the

capacity of existing transport vehicles. Given the lack of sufficient investment in public transport infrastructure in the city, the privately-owned buses rose to dominance and monopolized the sector, soon suffering from the oversupply of bus route permits, inadequate institutional capacity, and a fractured owner/driver relationship, resulting in fleet oversupply, low quality services and high social cost due to slow travel, high pollution, high accidents rates, and operating inefficiency. (Kooshian et al., 2012). The poor state of transport services pushed the public to car ownership and use causing accident rates, extremely severe air pollution during peak travel hours, and long commuting times. (Kooshian et al., 2012). Around ninety-five percent of the road network was used by 850,000 private vehicles which only transported about 19 percent of Bogotá's population (Bus Rapid Transit Project, n.d.) reflecting a deep inequity in the modal distribution and passenger demand.

Similar to Karachi, Bogota too for years had a transportation Master Plan that included a rail transit system but was never built. In the early 1990's, the metro idea was dropped and an exclusive bus-way was constructed along a downtown street for the thousands of private buses operating within the city. However, by the end of 2000 this bus-way was transformed into a BRT system (Kooshian et al., 2012) and in only a decade, the positive environmental, social, and economic impacts of TransMilenio began to show on the city.

The primary reason cited by 83% of TransMilenio users for using this service was the increase in speed (Bus Rapid Transit Project, n.d.) which is evident from the fact that average travel time for Bogotá residents decreased by about 20 minutes leading to an average annual saving of 223 hours. (Bus Rapid Transit Project, n.d.). In 2008, just eight years since its opening, the maximum daily demand approached 1 million passengers (Bus Rapid Transit Project, n.d.) which was met by 1200 large capacity centrally fleet managed modern buses replaced by 9,000 old inefficient buses. (Kooshian et al., 2012).

Since the introduction of TransMilenio, air pollutants within Bogotá decreased by 40 percent and there was an observed reduction of 92 per cent in fatalities, 75 per cent in injuries and 79 per cent in collisions. (Bus Rapid Transit Project, n.d.). Property values along the main line and stations increased by 15-20% (Kooshian et al., 2012) signifying a larger impact on the economic development and urban regeneration of the city. Improvements in the civil culture of the city through the use of a shared common good by all classes of people generated increased respect among the public, and created a sense of belonging for lower economic strata. (Bus Rapid Transit Project, n.d.). Thus, TransMilenio created social equity within the transit service as well as the city. What it took for Bogota to uplift itself out of miserable transport conditions was primarily a clear vision and a strong political leadership which unified various stakeholders into an accountable organization.

For this comparative analysis, reference is being taken from recommended guidelines on planning processes for a BRT project given in the publication 'Bus Rapid Transit, A Source for Policy Makers in the Developing Cities.' (Wright, 2003). Given the focus on aspects of sustainability in this study

and also owing to limited data availability on the BRT Karachi project, selected aspects of the planning process will be considered for the comparative analysis.

Universal features of BRT

- Exclusive right of way lanes
- Rapid boarding and alighting
- Free transfers between lines
- Pre-board fare collation and fare verification
- Enclosed stations that are safe and comfortable
- Clear route maps, signage, and real-time information displays.
- Automatic vehicle location technology to manage vehicle movements
- Modal integration at stations and terminals
- Competitively-bid concessions for operations
- Effective reform of the existing institutional structures for public transit
- Clean vehicle technologies
- Excellence in marketing and customer service

Source: Wright, 2003

STAGE I - PROJECT PREPARATION

Setting the Vision

The most essential step that precedes all planning is the broader vision of the project which provides continuous direction for the project and mandate to teams, as well as helps determine the broader goals of the project - its scope, all related activities, and their expected outcomes. Equally important, is its role in stimulating interest, [demand], and acceptance of the concept [project] with the general public. (Wright, 2003) For the TransMilenio BRT system, Mayor Enrique Peñalosa's overarching vision was creating a more egalitarian society, improving quality of life income levels, increasing [urban] productivity, and reducing congestion, all of which entailed reducing the emphasis on investment to support private automobile. (Kooshian et al., 2012). This vision dictated his planning approach which encompassed mainly three pillars of transformation: i) education on public awareness of transit and non-motorized travel options, ii) planning and constructing Bus Rapid Transit and bike infrastructure, and iii) restrictions on automobile use. (Kooshian et al., 2012).

I. Project preparation

Stage I: Preparation
- Political vision
- Legal basis
- Project team / structure
- Work plan and timeline
- Planning budget

Stage II: Analysis
- Background analysis
- Stakeholder analysis
- Data collection
- Modeling

Stage III: Communications
- Public participation
- Existing operators
- marketing Plan
- Public Education Plan

II. Design

Stage IV: Operations
- Corridor identification
- Feeder services
- Service options
- Passenger capacity
- Contingency planning
- Customer service plan

Stage V: Business structure
- Business structure
- Institutional structure
- Incentives for competition
- Operational cost analysis
- Tariff options

Stage VI: Infrastructure
- Conceptual study vs. detailed study
- Busways, stations, terminals, depots, control centre, integration
- Utilities, landscaping

Stage VII: Technology
- Vehicles
- Fare collection systems
- Intelligent transport systems
- Technology procurement

Stage VIII: Modal integration
- Pedestrians, bicycles, other transit systems, taxis
- Auto restriction measures
- Land use planning

III. Impacts

Stage IX: Impact analyses
- Traffic impacts
- Economic impacts
- Environmental impacts
- Social impacts
- Impacts on urban form

IV. Implementation plan

Stage X: Implementation plan
- Timeline and work plan
- Financing plan
- Staffing plan
- Contracting plan
- Construction plan
- Maintenance plan
- Evaluation plan

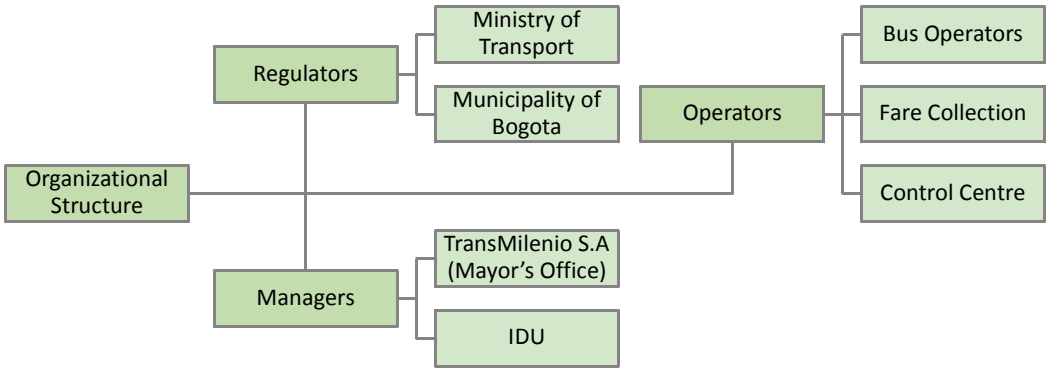
Overview of the BRT Planning Process.
Source: Wright, 2003

The first thing to understand about the Karachi BRT project is that the planning has not sourced from a centralized authority. Most of the defining guidelines came from studies carried out by JICA and later through the work of ADB. However, the proposed lines have been addressed mostly in isolation, while the centralized authority, now mandated to own and manage the project - Trans Karachi Breeze is yet to be operationalized. As such, an overarching vision never existed. As opposed to the TransMilenio, in the case of Karachi BRT, a critical authority such as the Karachi Metropolitan Corporation (KMC) has had no role to play in the process that significantly constrains possibilities of giving the project a much-needed public mandate, legitimacy and ownership. The focus is on getting people from point A to Z, while in the case of all the lines (with the exception of the Red Line) considerations for rolling out a wider public space agenda, land use implications and focus on related social, financial and environmental improvements on a city-wide scale are missing. The visioning process also involves getting all relevant stakeholders on board to both structure and own the vision, as happened in the case of the TransMilenio under the very recognizable leadership of Mayor Peñalosa. Till date, the Trans Karachi Breeze project has neither succeeded in mobilizing public opinion around a shared vision of the project nor has a centralized leadership having the required public legitimacy.

Legal Basis

Undeniably, the most important step in introducing a BRT system is having a proper legal framework in place and forming an organizational structure that embodies the vision of the project and subsequently plans, implements, and regulates it. In the case of the TransMilenio in Bogota, the legal and institutional roadmap was clear from the very beginning. The public sector will be responsible for the system's infrastructure and the oversight of the BRT system, while the private sector will be in charge of the system's operations and maintenance. TransMilenio S.A. will oversee the design, planning and monitoring of the system while managing the other entities involved in the system's operation. (Bus Rapid Transit Project, n.d.).

As illustrated in the chart below, the organizational structure of TransMilenio comprises of three divisions: regulators, managers and operators. The regulators of the system are the Ministry of Transport, which is in charge of national policies and plans, and the Municipality of Bogotá, especially the transit and transport secretariat. Managers include TransMilenio S.A. and IDU. Under the authority of the Mayor's Office, TransMilenio S.A. was incorporated in October 1999 as a dedicated agency. This transit authority plans, manages and controls the BRT system. IDU supervises the construction and maintenance of the infrastructure, which includes bus lanes, terminals, parking and maintenance yards as well as pedestrian overpasses, plazas and sidewalks. Both entities form part of the municipality of Bogotá. (Bus Rapid Transit Project, n.d.).



This legal and institutional structure provided the guiding and facilitating framework that ensured efficient planning and implementation of the TransMilenio. In the case of the Karachi BRT, such a framework till date does not exist. Right from the very beginning, the proposed recommendations coming from JICA and ADB regarding the legal and institutional requirements for planning and implementing the project in an integrated manner could not be adhered to. The project was conceptualized in the studies done by JICA that were later built on by the ADB.

From 2008 to 2012, the Japanese International Cooperation Agency (JICA) developed the Karachi Transportation Improvement Project, comprising a Transport Master Plan for Karachi, which proposed a mass transit network composed of two metro-rail lines [Brown and Blue], the revival of Karachi Circular Railway and six BRT lines [Red, Green, Orange, Yellow, Aqua, and Purple], of which the Red, Green, and Yellow lines were prioritized for immediate implementation. Building on this initiative, The Asian Development Bank (ADB) subsequently provided technical assistance to prepare Karachi's BRT Project. (ADB, 2018).

The ADB in its Project Design Advance document on the Karachi Bus Rapid Transit project identified the critical importance of the project. The document stated that "the proposed Karachi Bus Rapid Transit Project will help develop a sustainable urban transport system in Karachi, Islamic Republic of Pakistan, through the delivery of an integrated bus rapid transit (BRT) corridor. The project outcome will be improved public transport in Karachi, benefiting a population of 1 million." (ADB, 2016).

In the Project Preparatory Technical Assistance document, ADB proposed that "the PPTA will have the main following outputs: (i) policy reform framework and support to on-going institutional and organizational development in the urban transport sector in Sindh, such as establishing the Sindh Mass Transit Company (SMTC) and progressively setting up the Sindh Mass Transit Coordination Authority (SMTCA) to undertake planning, coordination, and regulation of all mass transit systems in Karachi." (ADB, n.d.)

The ADB Project Design Advance document identified a process of institutional transition. It was proposed that "the executing agency is the Planning and Development Department, and the implementing agency is the Government of Sindh's Transport and Mass Transit Department. Once the Sindh Mass Transit Authority is established, staffed, and operational, it will replace the Transport and Mass Transit Department as the implementing agency." (ADB, 2016).

In September 2016, under a $9.7 million project design advance loan approved by ADB, the legislation for the establishment of the Sindh Mass-Transit Authority was approved. (ADB, 2018). SMTA was designated responsible for developing policies and regulations, and planning, coordinating, and funding urban transport for all cities in Sindh, in addition to fulfilling the role of an oversight body for the BRT system. (ADB, 2018).

Its board of directors comprised of the Minister, Transport Department, Province of Sindh (chair); the Mayors / Administrators of Karachi, Sukkur and Hyderabad (co-chairs); the secretary of the

Transport Department; the secretary of the Finance Department; the secretary of the Planning and Development Department; the director General of the Public-Private Partnership Unit; the deputy inspector general of the Traffic Police; a representative of the Pakistan Engineering Council; the director of the Military Lands and Cantonments; a representative of the Pakistan Council of Architects and Town Planners; and the managing director of the SMTA (members). (ADB, 2018).

While the Sindh Mass Transit Authority (SMTA) was notified by the Sindh Government on October 17, 2016, with all the above-mentioned roles and stakeholders, it still struggles to influence effective control on the project.

The Sindh Mass Transit Authority Act 2014 clearly states that the SMTA would:

(a) own, control, plan, maintain, monitor, develop, coordinate, implement, operate and regulate Mass Transit systems along with all land, infrastructure (including stations, depots, terminations, roads, paths, bridges, buildings), systems and ancillary matters with related thereto;

However, after the SMTA remained in limbo for two years, in 2018, Trans Karachi Breeze was notified as a public listed company (listed in the Securities and Exchange Commission Pakistan). Supposed to work under the aegis of the SMTA, it would have a separate Board.

The company is to take control over the design, planning and implementation whereas the SMTA would restrict itself to policy and regulation. While the Board has been finalized, the company is yet to start operations, as it has no access to funding - two years down the road of the start of the Karachi BRT project.

Trans Karachi Breeze

A special purpose vehicle called Trans Karachi was licensed in June 2018 under the Securities and Exchange Commission of Pakistan as a Section 42 (nonprofit) public company. The only company owner is the Province of Sindh. The majority of the members in the company's Board of Directors (BoD) are ex-officio members (i.e members of the POS administration), with 6 representatives, there are also 5 Independent Directors, including the Chairman of the Company, representing the civil society.

In accordance with the authority delegated by SMTA and the mandate with which it was introduced, TransKarachi will be an active implementing partner for all project activities. It will implement and own the BRT infrastructure and assets, and will also be responsible for BRT operations and management of service contracts. It will be an allied organization to SMTA which is a superlative body responsible for oversight and regulation. Formed primarily due to the lack of institutional capacity of SMTA to run the Karachi Breeze, Trans Karachi will function under an appointed board, have a staff of 26 persons

Source: ADB, 2018

There are further complications that render the project a fragmented construct. All the corridors are to be planned, designed, funded, and constructed by different organizations, with no comprehensive plan to integrate them. (Adiwinarto, 2016). The very first 'line' - the Green Line -

that got designed and planned is currently being constructed under the mandate of the Karachi Infrastructure Development Corporation Limited (KIDCL), that is a federal entity (that was never a consideration in the project conceptualization process). Right now, while the construction work is planned to be completed by end March 2019, there is a continuing dispute between the federal and provincial government on how, when and by whom the operational matters of the Green Line will be managed. This state of confusion has characterized the whole process of Karachi BRT implementation where absence of a consistent and relevant 'legal framework' and lack of empowered and effective centralized authority has led to a fragmented and disjointed roll out of the project in terms of design, planning and implementation. The Green Line has been funded by the Federal Government while its feeder, the Orange Line is being funded by the Sindh Government. The Red Line is being funded by the ADB, while the funding for Yellow line is being negotiated with the World Bank. For the rest of the lines, situation remains unclear. As funding sources are a mix of local and foreign, the technical design, related social and environmental safeguards do not find compatibility. The Green Line is considered as a 'first generation' design while the Red Line complies with 'third generation' design requirements of BRT. The Green Line is silent on matters like inter-modality while the Red Line offers a variety of recommendations of linking the BRT with feeder transport options such as bike-sharing. The Orange Line and the Green Line also according to experts are not conforming to similar construction specifications and guidelines. (to be discussed in detail later)

STAGE III - COMMUNICATIONS

Public participation & engaging existing operators

Unlike motorized transportation, the process of planning a mass public transit is distinguished by its public outreach and stakeholder participation given the diverse users it extends services to. It is crucial to make stakeholders a part of this process in order to avoid any objections to the project after its completion and to ensure maximum public buy-in. The following stakeholders (Wright, 2003) and their roles in contributing towards the planning process should be identified at this stage:

- Existing transport operators, and operators' and drivers' associations (formal and informal)
- Customers (including current transit users, car owners, non-motorised transport users, student travel, low-income communities, physically disabled, elderly)
- Municipal transit departments
- Municipal environmental departments
- Municipal urban development departments
- Traffic and transit police
- Relevant national agencies
- Non-governmental organisations
- Community-based organisations

The TransMilenio was characterized with a very robust public consultation, public education and marketing/branding plan that was effectively implemented and had a major contribution in ensuring acceptability and success of the project. On the contrary, the Trans Karachi Breeze project is characterized by a lack of all the above.

"Both national and local stakeholders were involved in the planning and implementation of the BRT under TransMilenio S.A. Those people with the most experience, government officials and bus operators from the old public transportation system, all provided input into the design and planning of the new BRT system. Open lines of communication allowed concerns to be voiced and resolved so that major roadblocks to the new public transportation system could be avoided. All of the partners who received contracts to operate in TransMilenio were selected by TransMilenio S.A. through an open and competitive bidding process. In an effort to acclimate passengers to the new system, TransMilenio ran free of charge from 18 December 2000 to 6 January 2001." (Bus Rapid Transit Project, n.d.).

Opposition from Transport Industry Leaders

The reaction of traditional bus companies to the proposal of a BRT system in Bogotá was negative. A main cause of resistance from existing bus operators was the feared loss of business. However other issues ensued such as the replacement of direct permitting allocation with a bidding process, the huge financial risk involved with investments in bus acquisition, and the uncertainty of the government being able to follow through with building planned infrastructure and retiring existing operators. These factors caused existing operators to strongly oppose the implementation of TransMilenio and proved to be a critical barrier to the BRT's success. Several methods were employed by city agencies to overcome the resistance of bus operators and make them pertinent stakeholders in the planning and implementation of TransMilenio. First, the Terms of Reference included experience in public transportation in the city as a prerequisite, which basically secured the participation of bus companies in the bidding process (and bus owners in Phase II). In fact 59 out of 64 companies become shareholders of the bidding companies, but the mass transit system was only controlled by a few of these companies. Second, open dialogues with transport companies were held in order to include them in the relocation of routes and the negotiations of terms and conditions of contracts. These tactics were instrumental in overcoming the initial strong resistance from existing bus operators and getting them to become shareholders in the new BRT system.

Source: (Kooshian et al., 2012)

A good transit service is one which integrates itself with the existing transit services and seeks to enhance their operations instead of posing a threat to their business. (Wright, 2003). The BRT project should be used as an opportunity to improve the working conditions of the existing operators, (Bus Rapid Transit Project, n.d.) especially in developing cities where informal and un-regularized systems monopolize the transport sector. Mutually beneficial partnerships can be formed that promise profits to not only the existing operators but also prove cost-effective and resource-efficient for the new project. A proper outreach strategy (Bus Rapid Transit Project, n.d.) should be prepared and implemented at this stage by the planning team to initiate effective consultations with this group.

From the beginning of the BRT implementation, the private transportation operators that used to provide transit service in Bogotá were involved in the planning process. Keeping the operators of the old system informed and allowing them to partake in TranMilenio planning helped to prevent possible protests and work stoppages. Finally, no operator was excluded from bidding for a position in the new system. (Bus Rapid Transit Project, n.d.).

In the case of the Karachi BRT, for the Red Line, a strategy has been worked out while it remains vague and non-implemented in the case of the other lines. ADB has laid out a "bus industry transition process" under which extensive negotiations with private bus operators will take place as well as their capacity building in order to become operators of the new system. (Karachi Bus Rapid Transit Project, 2018; ADB, 2018). While one of the official document states in writing that a transition process will also take place for the Green and Orange lines, implemented prior to the Red line, to ensure a common approach and minimize potential conflicts that could affect the project's implementation (ADB, 2018), no such process has been undertaken in practice for either of the lines. For the Red Line, consultations with existing bus operators' federations were held by consultants to inform operators about the project, and skilled negotiators have been recruited to further discuss and develop a business model to include the existing operators as much as possible in the BRT operations. (ADB, 2018). To enable transition, the initial BRT fleet will be financed under the project and leased to private operators to reduce the need to mobilize capital and allow existing operators to participate in the bidding process. (ADB, 2018).

The Red Line also includes a fleet scrapping program and compensation mechanism for non-participating [bus] operators. (Karachi Bus Rapid Transit Project, 2018; ADB, 2018). This is to ensure that the existing old buses are off the road and do not compete with the new BRT service and moreover, to reduce additional emission reductions. (ADB, 2018).

Marketing & Public Education Plan

One of the barriers that Bogota had to overcome for seeking public's acceptance of BRT was the negative stereotype associated with existing bus services. (Wright, 2003). They countered this aversion by leveraging a strong "marketing identity" (Wright, 2003) for TransMilenio. As a starting point, they created a name and logo that imparted the sense of a new type of transit service and instilled a modern image of it with the customer. (Wright, 2003). Exciting the public's imagination through the intangible identity of the product became the key to selling the BRT concept and system to people.

Running educational campaigns prior to running operations is necessary for informing, preparing, and mobilizing the customers for the transit service. In Brisbane, the customers were engaged through information kiosks and in Peru, the concept was demonstrated through tangible model installations of a station and vehicle to excite the public, and help them understand and experience various system services such as fare collection before its implementation. (Wright, 2003).

Karachi Breeze has been approved as the official name by SMTA for Karachi's BRT System. "The concept behind the name comes from ease in transport that BRT will provide to general public for their daily commute . . . the commuters of [this] metropolitan city would feel relief from past traveling congestion and this system would provide them a comfortable and reliable transport services." (Daily Times, 2018).

All three lines lack a proper marketing plan, uniform marketing identity, and public education plan to popularize the idea of BRT, engage and excite the users to gain ridership, integrate and disseminate information to the public on routes, fare collection, service timings, safety protocols, disability provisions, and technology.

Project design documents for Red Line mention in a few words the plan to implement an effective communication and marketing strategy including multimedia campaigns and stakeholder engagement. (PSI, 2018). When asked about the communication activities if any undertaken by SMTA for the Green and Orange line, the responses were multiple and contradictory. First it was mentioned that the communications/public information policy will be developed by ADB for all lines whereas none of the ADB documents reflect this in their output. In another instance, it was communicated that KIDCL will adopt a communications strategy which will be uniform across the board [all other lines] as the consultants they hire will be the same for Red Line. Unclear as it is, it was then assured that SMTA has a communications specialist who will work in collaboration with ADB to develop a strategy for all lines.

STAGE IV - OPERATIONS

Feeder Services

A trunk-feeder service option helps provide a true "city-wide" transit service to both high-density and low-density areas of the city without sacrificing from the system pockets of population residing on the fringes of the city. (Wright, 2003). While this option is most feasible for developing cities that have expanded horizontally, the decision to choose a trunk-feeder services ultimately depends on factors including structure of the city, the variation of population densities and service demand across di?erent sectors of the city, distances to be travelled, and the business structure of the system. (Wright, 2003). Curitiba, Bogota, and Quito being the leading BRT systems around the world have trunk-feeder services. (Wright, 2003).

In Bogota, the articulated buses that run on the dedicated lanes have a capacity of 160 passengers and are built with clean diesel engines that comply with Euro II environmental standards. Smaller feeder buses, with a maximum capacity of 80 passengers, were also integrated into the system. Seven feeder zones with 309 kilometers of feeder routes within 74 neighborhoods were established to move passengers from remote areas to the main BRT system. (Bus Rapid Transit Project, n.d.).

Karachi is a built city and that too mostly in an unplanned way, so it was difficult to develop routes that can provide the desirable level of access. As such it was critically important to plan for bus-way integrated 'feeder' modes or to utilize existing transport modes such as mini-buses/qingqis, or KCR or both. Other than the Red Line, that has integrated feeder modes, no other line has planned for this. The Red Line ADB plan states that "bike sharing systems will include conventional bicycles, e-bicycles as well as cargo bicycles (in total around 500 units). A modern e-pedicab vehicle (initial usage in a pilot project of ADB in Nepal) will be used for the last-mile connectivity. There is also a USB cell phone charge allowing passengers to get a quick charge on their ride. Around 300 e-pedicab units shall be purchased. This replaces short trips made currently also with NMT and motorized rickshaws (CNG units). The BRT infrastructure also includes cycling lanes which are a pre-condition for a sustainably high share of cyclists due to allowing for safe, convenient and fast cycling." (ADB, 2018). This fact again brings out the discord and lack of compatibility in design and operations amongst the Karachi BRT lines.

Lack of cohesion and not having a larger vision is apparent in not including in the planning process existing potential transportation modes and networks. Foremost among them is the KCR. This

despite that fact that JICA in its Master Plan Study had clearly identified the critical value addition importance of KCR in complimenting the BRT project. The Master Plan stated "to formulate the master plan network from the full network, five railway routes were evaluated, and two railway routes (Blue Line and Brown Line) were selected for the master plan network. KCR has been given the highest priority because it can reach the center of the city without underground section, and the preparatory works including EIA are almost completed." (JICA, 2012). The KCR project has no synergy with the BRT project. It was designed and planned under the aegis of the Karachi Urban Transport Corporation (KUTC) that is a federal entity. The services as yet remain suspended and recent surveys have indicated no chance of any early operationalization of the KCR project.

STAGE V - BUSINESS & INSTITUTIONAL STRUCTURE

Perhaps the most crucial determinant of the BRT system is its institutional structure and its capacity to develop and maintain a corrupt-free, efficient, and competitive transit environment in the longer run. Hence, a significant decision is whether the institutional oversight for such a system will be implemented through an existing agency or a newly created organization. (Wright, 2003). In the case of Bogota, a new public company by the name of TransMilenio S.A. was formed under the leadership of the Mayor, comprising of board of directors whose members included non-governmental organizations and citizens. (Wright, 2003). The rationale was that a new organizational management with such diverse representation provides insulation from political influences, vested interests and traditional mindsets and drives innovation. (Kooshian et al., 2012). The existing public transport services /industry in developing cities can be characterized into either one of the following business structures (Wright, 2003):

- Public systems
- Private sector systems
- Mixed systems (public and private roles)

A mixed structure exploits the potentialities of both public and private systems to provide a service that is competitive, cost-effective, and of high-quality. TransMilenio has successfully adopted this model in which the existing private bus operators are integrated into the new system by competing within a publicly-controlled system. While system planning and judicial oversight is provided by TransMilenio S.A. (a public company), the operations and maintenance of the service is contracted to private operators. This public-private arrangement has given shape to a more consolidated structure where instead of small independent enterprises competing at bus-to-bus level, they now have formal enterprises competing for concessions. (Bus Rapid Transit Project, n.d.).

As has been identified earlier, in the case of the Karachi BRT, no 'model' exists. We are still experimenting, two years down the road. The Green Line got initiated by the KIDCL (a federal entity) where no foreign/donor input was excessed either in design or construction. Then SMTA, a provincial entity started work on the Orange and Red Line. Orange Line, was again totally funded and executed with local funding, though not by the federal as was the case with the Green Line, but by the Sindh/provincial government. Red Line design has been funded and prepared by ADB, while they are willing also to commit funding for construction but only once the relevant legal and institutional requirements are sorted out that are still pending. That is because now Trans Karachi Breeze has been listed as a public company to own and manage the Karachi BRT, reporting to its own Board that sits under the Board

of the SMTA. However, to this date the Trans Karachi Breeze has not been made operational pending availability of funds. While there is talk on outsourcing functions to the private sector once the project is operational, no clear details have been indicated nor does a regulatory framework or necessary capacity exists within the SMTA to manage such complicated contracts.

Conclusion

It can be concluded that this comparative analysis leaves one with a heightened sense of concern as serious doubts are raised about both the viability of the ongoing planning and implementation process and the sustainability of the post implementation operationalization stage. Critical requirements of the recommended guidelines such as having a centralized, empowered and properly placed central authority embedded within a structured legal framework, mobilizing of a broad base of stakeholders around a shared vision and process, compatibility in design, operational and financial models and the linking of a wider city-based, social, environmental and economic agenda with the project are missing. It comes as no surprise then that working timelines of different lines don't synchronize, design, planning and implementation models are incompatible, and the public at large remains in the dark about the inner details of the project or how its activation would impact their lives. However, there is still time to change gear, rationalize the inconsistencies and limit the damage already done. However, that would require strong political will, institutional strengthening and capacity building, and a larger vision shared by all relevant city stakeholders that guides the direction of this transportation related intervention towards achieving the core requirements of sustainable urban mobility.

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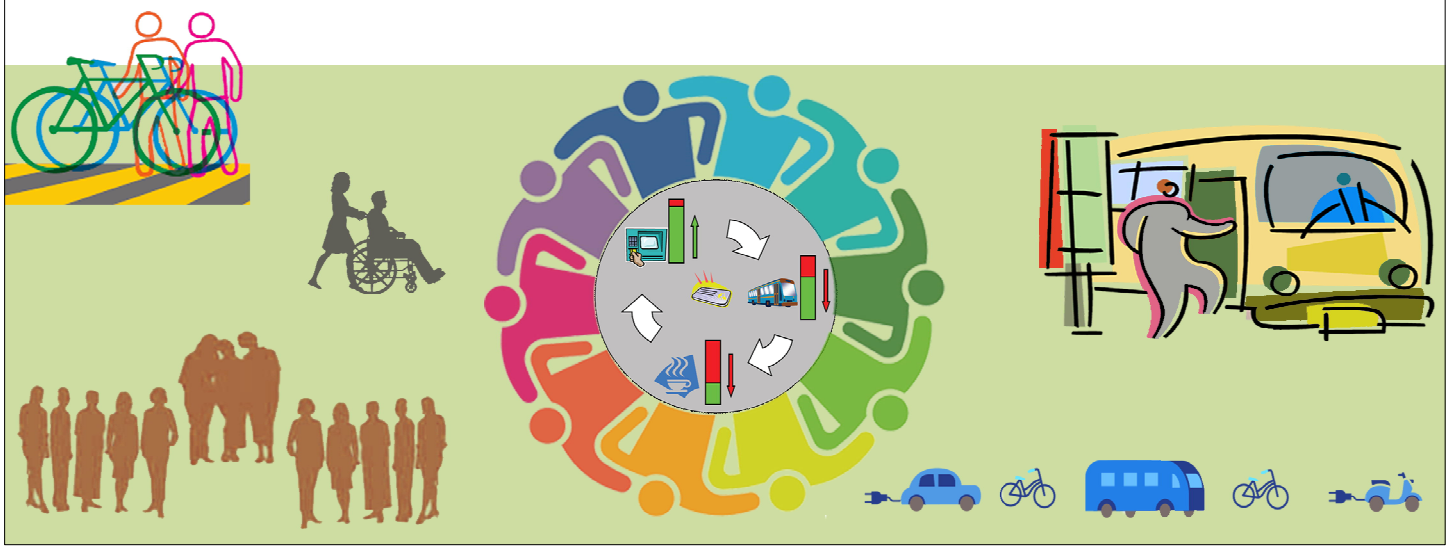
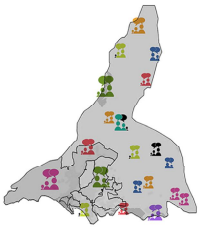
SECTION 5

Exploring Synergies and Collaborations Stakeholder Consultations



ORIENTATION WORKSHOP # 1



Venue: Hotel Marriot
Date: August 16, 2018
Stakeholder: Civil Society, Media and Academia
No. of Participants: 44

Objective

- To inform participants about the project and have an interactive discussion with them on mobility issues in Karachi
- To gauge participants understanding regarding upcoming BRT Projects in the city
- Create awareness on projects being undertaken in the private, non-governmental and informal sector to promote inclusive mobility

Format

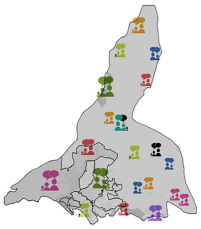
The project was presented and discussed in the context of sustainable urban mobility. NOWPDP, an NGO working for empowerment of disabled community presented their "Rickshaw Project" and other solutions for facilitating mobility of disabled persons and improved livelihood. Furthermore, a moderated consultative session was conducted with civil society, media, experts and academia to create awareness and seek solutions

Observations / Recommendations

- The presence of multiple authorities and disintegrated power has caused failure of a number of projects in Karachi
- BRT Projects should be integrated with Karachi Master Plan 2020
- Innovative solutions like carpooling apps, foldable bicycles should be promoted. Additionally, incentives for carpoolers like designated parking etc., should be introduced

- BRT fares should be subsidized to promote its usage
- Cycling groups should be promoted by the government and bicycle stands should be added next to BRT Terminals
- The routes of BRT lines should take hospitals and schools into account
- Regulations for all types of vehicles should be implemented

ORIENTATION WORKSHOP # 2



Venue: Playground Space, Habib University
Date: September 08, 2018
Stakeholder: Students
No. of Participants: 32

Objective

- To inform participants about the project and have an interactive discussion with them on mobility issues in Karachi
- To gauge participants understanding regarding upcoming BRT Projects in the city
- Seek recommendations (working groups) on how urban mobility can be improved
- To identify areas for collaboration in the project (with Habib University)

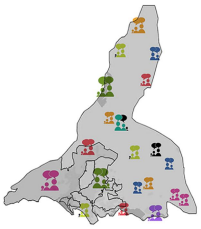
Format

The project was presented and discussed in the context of sustainable urban mobility. In the first interactive phase, a 'Problem Identification Activity' was executed to determine working group themes, which were - Making Karachi Bicyclefriendly, ICT Tools for Urban Mobility & Evaluating Inter-modality Services in BRT. In the next phase, four Working Groups were made to strategize solutions under these themes. In the last phase, the working groups presented their solutions

Observations / Recommendations

- Promote mobile apps to mine data for travel ease and time, to increase use of public transport
- Introducing bicycle stands at BRT terminals and in city neighborhoods, commercial spaces to promote intermodal transportation and general use of bicycles
- Developing carpooling apps to minimize number of cars
- Awareness programs should be initiated in educational institutions

ORIENTATION WORKSHOP # 3



Venue: Directorate of Urban Policy & Strategic Planning
Date: September 25, 2018
Stakeholder: Government officials relevant to the transport and urban planning sector No. of Participants: 32

Objective

- To inform participants about the project and have an interactive discussion with them on mobility issues in Karachi
- To gauge participants understanding regarding upcoming BRT Projects in the city
- Seek information on the working and mandate of relevant government authorities
- To identify areas for collaboration in the project

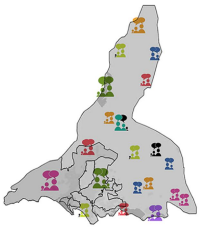
Format

The project was presented and discussed in the context of sustainable urban mobility. Representative of Sindh Mass Transit Authority (SMTA), Traffic Police and experts also spoke. Examples of cities where government officials and municipal authorities played a key role in developing a sustainable mobility agenda were highlighted. Furthermore, an interactive discussion was done where the officials highlighted issues in their respective mandates and gave suggestions on how improvements can be made

Observations / Recommendations

- There is a need to have greater synergy in the working of the various government authorizes
- Issues such as the relation of transport projects and infrastructure with land use needs to be considered in urban planning
- Better traffic management can solve a lot of problems
- Public information and awareness is very important for acceptance of projects such as the Karachi BRT project
- Innovative options for outsourcing work to the private sector need to be leveraged
- Government needs to be engaged with the civil society to better understand the problems being faced by the people

FOCUS GROUP DISCUSSION # 1



Venue: KMC Head Office, M.A. Jinnah Road
Date: November 7, 2018
Stakeholder: KMC Councilors, staff of CIIMS and Transport & Communications Department
No. of Participants: 41

Objective

- To inform participants about the project and have an interactive discussion with them on mobility issues in Karachi
- To gauge participants understanding regarding upcoming BRT Projects in the city
- To understand the role of KMC councilors and Transport & Communications Department in creating a sustainable urban mobility agenda for Karachi
- To identify areas for collaboration in the project

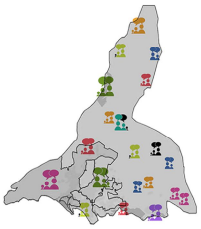
Format

The project was presented and discussed in the context of sustainable urban mobility. Examples of cities such as Bogota, where government officials and municipal authorities played a key role in developing a sustainable mobility agenda were highlighted. Furthermore, an interactive discussion was done where the councilors highlighted issues in their respective towns and gave suggestions on how improvements can be made

Observations / Recommendations

- Transport & Communication Department officials discussed their plans to promote road safety by introducing smart signals, starting with Shahrah-e-Faisal (from Metropole to Malir). In this regard, Trauma Centers were also created in 2015 to document and report data on road accidents in the city
- KMC Councilors stressed the need to make parks and public spaces more accessible to public through redesign, adding security and regular maintenance
- Proposed lane markings on secondary and tertiary roads in their respective towns
- A possible Model footpath / street design could be done in collaboration with District officials
- They also showed willingness to create awareness on traffic safety through seminars and workshops

FOCUS GROUP DISCUSSION # 2



Venue: NED University, City Campus, Saddar
Date: November 08, 2018
Stakeholder: Communities
No. of Participants: 45

Objective

- To inform participants about the project and have an interactive discussion with them on mobility issues in Karachi
- To gauge participants understanding regarding upcoming BRT Projects in the city
- To discuss and document problems the communities face in accessing and commuting in public transport (NED University, City Campus was chosen for the venue as a Greenline BRT Station has been proposed in close proximity to it)

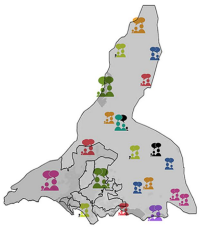
Format

The project was presented and discussed in the context of sustainable urban mobility. The discussion was divided into two phases. In the first phase, participants were briefed about climate friendly and equitable urban mobility measures. In the second phase, participants discussed their mobility issues at length while residing and accessing the neighborhoods and commercial spaces and also proposed solutions to combat them, based on their learning and experiences

Observations / Recommendations

- The top most priority was given to take measure to improve walkability within the neighborhood. Participants discussed that major roads within Saddar do not have demarcated and adequately designed sidewalks
- Waiting time of public buses should be reduced to 5 minutes Measures should be taken to combat harassment in public buses and streets
- Bus stops should be designed to facilitate the users
- Number of designated female seats should be increased
- Streets should be equipped with street signs, lights and furniture
- Intermodal streets should be designed to promote BRT projects within the city

FOCUS GROUP DISCUSSION # 3



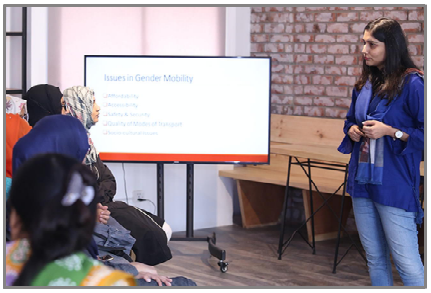
Venue: National Incubation Center (NIC)
Date: November 14, 2018
Stakeholder: Women's groups and girl students
No. of Participants: 45

Objective

- To inform participants about the project and have an interactive discussion with them on mobility issues in Karachi
- To gauge participants understanding regarding upcoming BRT Projects in the city
- Seek recommendations (working groups) on how gender mobility can be improved

Format

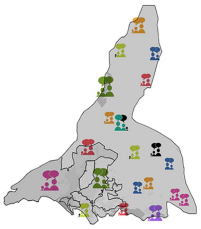
The project was presented and discussed in the context of sustainable urban mobility. Discussion was held on problem identification on gender mobility under the heads of quality of modes of transport, safety and security, affordability, accessibility and socio-cultural issues. The participants were later divided into four working groups to brainstorm and present solutions to the identified problems



Observations / Recommendations

- Majority of the participants highlighted harassment as a major issue while using public transport and stressed on the lack of implementation of laws related to women's safety. Suggested that a regulating authority should be formed to register complaints
- The unequal distribution of seats in buses was identified as an additional disadvantage
- Bus drivers should be trained and educated
- Bus stops are not adequately designed to facilitate women
- Public transport should be designed to accommodate pregnant women and women with disabilities
- Undefined bus routes and irregular arrival of buses also adds to their plight
- There is an urgent need of training programs to promote mobility of women in the city

FOCUS GROUP DISCUSSION # 4



Venue: NOWPDP Office, Saddar
Date: November 26, 2018
Stakeholder: Persons with disabilities
No. of Participants: 42

Objective

- To inform participants about the project and have an interactive discussion with them on mobility issues in Karachi
- To gauge participants understanding regarding upcoming BRT Projects in the city
- To discuss and document problems the disabled people face in accessing and commuting in public transport and in walkability
- Identify areas for collaboration in the project (with NOWPDP)

Format

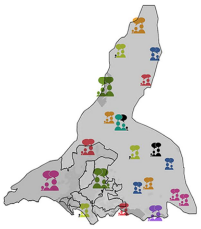
The project was presented and discussed in the context of sustainable urban mobility. The program was divided into two phases. In the first phase, the participants shared their personal experiences and issues with mobility in Karachi. In the second phase, design-based solutions were demonstrated by the project team to the audience in order to create awareness as to how their issues can be resolved with some modification or innovation

Observations / Recommendations

- The participants shared that they suffered economically as their mobility within the city is not easy and they often have to turn down the opportunists they are offered
- Public transport is not designed to meet their requirements and private transport, albeit somewhat better, is too expensive

- Many of the participants suffered from low self-esteem due to constant bullying by society and dependence on others
- A few participants also possessed 'Disability Identity Cards' issued by the government but found them useless as no provisions exist for them. Even drivers of public buses do not stop for them
- Participants also shared that official and public buildings are also inadequately designed which makes regular tasks like bill payment even more difficult for them

FOCUS GROUP DISCUSSION # 5



Venue: NED University, Main Campus
Date: November 27, 2018
Stakeholder: Faculty and students, Urban and Infrastructure Department
No. of Participants: 45

Objective

- To inform participants about the project and have an interactive discussion with them on mobility issues in Karachi
- To gauge participants understanding regarding upcoming BRT Projects in the city
- Seek recommendations (working groups) on how urban mobility can be improved
- Identify areas for collaboration in the project

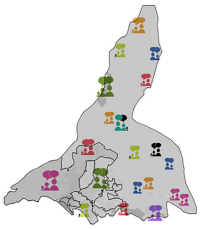
Format

The project was presented and discussed in the context of sustainable urban mobility. In the first interactive phase, a 'Problem Identification Activity' was executed to determine working group themes, which were Making Karachi Bicycle-friendly, ICT Tools for Urban Mobility & Evaluating Inter-modality Services in BRT. In the next phase, four Working Groups were made to strategize solutions under these themes. In the last phase, the working groups presented their solutions

Observations / Recommendations

- Promote mobile apps to mine data for travel ease and time, to increase use of public transport
- Introduce loyalty cards to promote BRT usage, to be redeemed at restaurants, malls, etc.
- Introducing bicycle stands at BRT terminals to promote intermodal transportation
- Arranging competitions to promote usage of bikes. Possible collaboration with Pakistan Cycle Federation (PCF) and Pakistan Olympic Association (POA)
- Encourage private sector to invest in feeder services
- Developing carpooling apps to minimize number of cars
- Increase parking rates in CBD to discourage private cars
- Awareness programs should be initiated in educational institutions

FOCUS GROUP DISCUSSION # 6



Venue: Institute of Architects Pakistan (IAP) House, Clifton
Date: December 14, 2018
Stakeholder: Institute of Architects Pakistan (IAP)
No. of Participants: 25

Objective

- To inform participants about the project and have an interactive discussion with them on mobility issues in Karachi
- To gauge participants understanding regarding upcoming BRT Projects in the city
- To discuss and understand the work of IAP and how they could contribute to improved urban mobility
- Identify areas for collaboration in the project

Format

The project was presented and discussed in the context of sustainable urban mobility. Global case studies were presented where architects collaborated with government and organizations to establish mobility agendas for cities. Mobility issues in Karachi were discussed and design-based solutions were presented. The session concluded with an interactive discussion on possible projects and collaborations with IAP

Observations / Recommendations

- There is a need to bridge the gap between academia and government bodies. This can perhaps be done by holding competitions or showcasing thesis projects of architecture students and inviting government officials to view and discuss them. These academic projects can then be integrated with developments of the government
- IAP members highlighted their collaboration with the government to carry out an audit indicating accessibility of public buildings in Karachi, which can serve as a basis for future projects to promote accessibility within the city
- Standardization of street design was suggested as another area where architects and bodies like IAP can contribute

SECTION 6

Sustainable Urban Mobility in Karachi
A Strategic Framework

This paper has endeavoured to deconstruct the transportation and urban mobility scenario in Karachi within the larger context of urban development. There has been an effort to trace the historical progression of the sector in terms of changes in the policy and institutional constructs, progressive decline in the role of the public sector in provision of services, subsequent increase in the non-regulated role of the informal and private sectors, and its implications for sustainable urban growth within a dysfunctional construct of sector governance. A critical analysis has been made of the ongoing Trans Karachi Breeze project to bring out a number of disturbing gaps and lapses in the project planning and implementation processes that also find a context in the existing voids in the institutional framework governing, or rather, mis-governing the sector.

The concluding section of the Strategy Paper now aims to outline a strategic roadmap for sector wide improvements that can find a resonance with the core requirements of having a system in place that complies with the principles of Sustainable Urban Mobility. In order to structure this Strategic Roadmap, reference has been made to the planning framework - 'City Development Strategy.' Blended within this strategy building framework are the core principles and guidelines of the 'Sustainable Urban Mobility Planning' (SUMP) processes.

City Development Strategy

Developed by the City Alliance[2], the City Development Strategy (CDS) is defined as an action-oriented process, developed and sustained through participation, to promote equitable growth in cities and their surrounding regions to improve the quality of life for all citizens. A CDS helps cities integrate a strategic development approach and a long-term perspective into their urban planning. With a CDS, cities move beyond planning around the short-term political or donor-funding cycle to considering where they should be in 20 or 30 years, and the steps that need to be taken to achieve those goals. The idea behind a CDS is that well-positioned and well-timed public, private, and civil society strategic interventions can significantly change a city's development path and improve its performance.

A city development strategy is a tool that helps a city harness the potential of urbanization. It also enables a city to develop a coordinated, institutional framework to make the most of opportunities. Whether a CDS is successful or not depends on its main strategic goals. For example, if a city emphasized poverty alleviation in its CDS, then a reduction in the number of poor residents would be a successful outcome.

Broadly, the outcomes of a successful CDS include:
Behavioral changes, in which the process of how to deal with strategy becomes embedded in local planning and among citizens. It also involves the development of an ongoing process to constantly update the CDS.

[2] The Cities Alliance is managed through a Secretariat based in Brussels and is hosted by the United Nations Office for Project Services (UNOPS). Through UNOPS, the Cities Alliance operates a Multi-Donor Fund supported by an efficient, flexible grant-making mechanism with global reach

Monitoring mechanisms for urban performance, so that citizens, local governments and the private sector can all measure development

Policy and institutional reforms, such as consolidating disparate agencies or the development of mechanisms for cooperation that increase efficiency

Public and private sector investments, in key strategic activities

The Challenges

The critical challenges that the Strategy has to address that have been identified during the course of this study include:

- A dysfunctional governance structure for the sector that fails to sustain public policy interventions
- A complete absence of integration between land use and transport planning
- High levels of car/motorcycle ownership and car use and dependency that prevents viable transition to modes of public transit
- Poor facilitating infrastructure for non-motorized transport and walkability that renders such mobility open to safety and traffic hazards
- Absence of viable policy, implementation, regulation and monitoring mechanisms to prevent harmful effects of transport on human health, the environment and implications for climate change

Strategic Roadmap for Sustainable Urban Mobility in Karachi City

We often fail with our development-based interventions as the focus is on the 'project' with the project having no pre or post script to it. This is true for both macro and micro level development in Pakistan. The 'projects' find no interface with a larger vision and strategic planning for the sector, as well as its impact on other sectors. Consequently, neither a larger footprint nor long term sustainability of the project-based intervention is achieved. Similar has been the case with the 'transportation and mobility' sector in Karachi. Projects have come and gone and we find ourselves in a much worse state than we were fifty years ago. The Trans Karachi BRT is likely to suffer a similar fate if efforts are not made to embed it within an overarching vision for sustainable urban mobility in the city coupled with a strategic framework of action.

Strategic Principle

The core strategic principal that needs to define the vision and strategic planning has to be framed around an urban mobility system that is inclusive. It may be coined as:

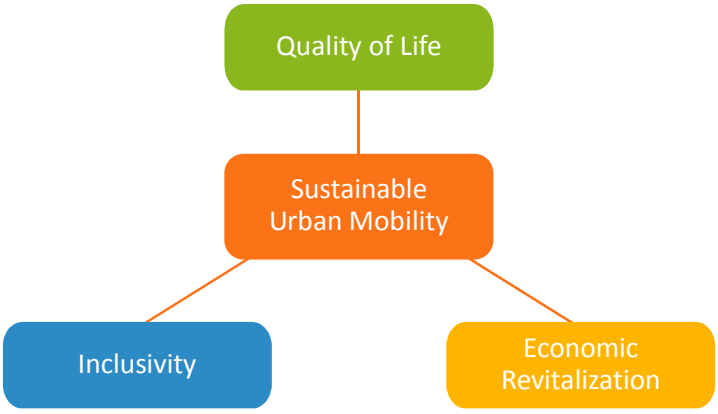
'Spatial and social cohesion through an efficient and equity based urban mobility system'

Strategic Vision

Then comes the comprehensive visioning process. The city planners and policy makers need to develop a long-term vision for the city by engaging all relevant stakeholders. A vision that reflects

an overarching understanding of urban mobility blended with issues of equity, environmental concerns and climate change, where transport related interventions also contribute to more sustainable land use and economic revitalization of the city.

The defining contours of the 'vision' can be influenced by certain specific considerations as are illustrated below:



Quality of life can relate to the comforts and conveniences that will be provided to the users through improved accessibility - reduction in physical and psychological stresses, livelihood improvement and increased sociability with activities like walking and cycling contributing to improved health and well being

Economic revitalization will happen as improved access can lead to improved land uses and economic activities - financial, commercial, institutional, recreational etc.

Inclusivity will enhance as mobility would be ensured for all irrespective of their gender, physical mobility or socio-economic status and not just within the modes of transport, their access would also be facilitated in urban spaces

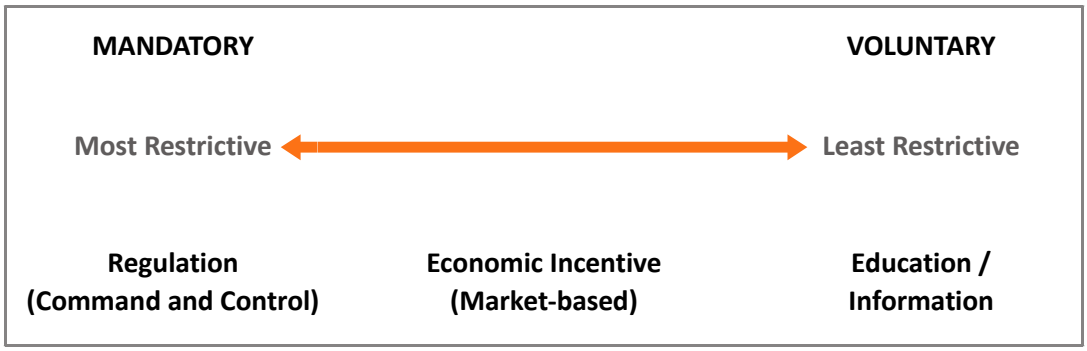
Strategic Objectives

- Having a viable policy, institutional and financial framework that allows for implementing long-term public policy for sustainable urban transport
- Reducing harmful effects of transport on health and the environment and its contribution to climate change
- Reducing car use, promoting public transport and facilitating non-motorized modes of transport such as walking, cycling
- Improving the safety and security of road users, particularly pedestrians, cyclists and public transport users
- Enhancing thorough increased access, public spaces and commercial and economic activity

It is critically important to understand that only a holistic approach can find viable solutions. This fact is brought out well in the Study by Institute for Transportation and Development Policy documenting urban mobility transformation in the city of Mexico. The Study states that "enforcing a single type of measure, such as building more road infrastructure, does not reduce the negative externalities of car use, nor do solutions of using high-yield vehicles on their own. The latter even tend to aggravate issues of traffic safety, land use, and health. Various solutions need to be implemented in order to manage mobility and achieve real sustainable transport that benefits all of society. That is to say, mobility should be managed in an integrated manner, with specific objectives for reducing car use that eliminates its negative externalities. This includes implementing strategies that encourage a greater use of sustainable transport modes (with lower external costs being generated), improving and increasing the public and non-motorized transport offering, and using the available technological tools to diminish the impacts generated by car use." (ITDP, 2012)

Similarly, in terms of implementing strategies a 'one shoe fits all' approach will not work. The Study identifies a mix of approaches to be adopted relevant to the requirements of each objective that is desired to be achieved. It states that "it is important to point out that each of these instruments has a spectrum of how mandatory it is to implement, varying from voluntary to obligatory. The current magnitude of the problem-the accelerated growth of negative externalities from car use-makes full use of the spectrum of instruments, from the least to the most restrictive. The application of voluntary and less restrictive instruments, as well as the use of market-based economic instruments, no doubt contributes to reducing the problem. This is not to say that the regulatory instruments are to be neglected, especially the physical, which together with other measures allow for the effective reduction in indiscriminate car use." (ITDP, 2012)

STRATEGY APPROACHES



Source: Adapted from Dalkmann and Brannigan (2007)

Instruments available for generating Sustainable Mobility

Planning Instruments - These include all the measures that are focused on the planning of urban growth and its infrastructure. The ordering of the activities that take place in a given territory plays a key role in reducing the kilometers travelled by car and achieving an integrated and sustainable transport system. This requires a change in the pattern of development that influences a city's location, scale, density, design, and mixture of land uses. Outstanding among planning instruments are the re-densification of city centers, mixed land use, planning oriented to transport, car-free planning, and intelligent urban development. They also include the provision of public and non-motorized transport, and public systems for bicycles and cars.

Regulatory Instruments - Known as instruments of command and control, these instruments are focused on reducing kilometers travelled by cars and are of two types, physical and legal. Regulating space by means of physical instruments consists of constructing infrastructure that discourages car use and encourages the use of other modes of transport. Examples include the construction of traffic calming zones or the pedestrianization of streets. Regulatory instruments of the legal type are the laws, norms, and regulations that cars and their owners must comply with. Examples of these are low-emission zones, high-occupancy lanes, emission and circulation regulations, regulating minimum parking requirements for businesses and construction sites, and regulation of ownership.

Economic Instruments - These oblige the motorists to pay for the damages they inflict on society, encouraging less reliance on cars and thereby increasing social well-being. Among the different instruments are the fuel tax, the property tax, parking meters, and congestion charges. Empowering these instruments requires incentives for less polluting car use, such as feebate schemes (discounts on the purchase of new and efficient cars and fees on inefficient ones - Medina et al., 2011) and schemes for scrapping old vehicles. Likewise, the necessary incentives can be generated for promoting public transport by means of subsidies or financing with public spending.

Information Instruments - Campaigns for awareness building, sensitization, making information public, and policies on education: these "soft" instruments generate changes in behavior and can be decisive for the success of other instruments implemented.

Technological Instruments - Their potential resides in increasing the benefits of other measures intended for reducing car use. For example, the dissemination of information by means of mobile phones on parking prices and availability of spaces contributes to reducing the distances travelled by motorists, empowering parking administration policies.

Source: ITDP, 2012

Transforming Urban Mobility in Karachi - A Framework for Action	
Strategic Objectives	**Lines of Action**
Having a viable policy, institutional and financial framework that allows for implementing long-term public policy for sustainable urban transport	- Structure the architecture of an empowered and consensus based 'centralized authority' looking after policy, planning, implementation, regulation and monitoring of transport/mobility interventions in the city. - SMTA can provide an umbrella framework, while a separate entity within this framework be created for Karachi city (the SMTA Act would need to be revised) that has appropriate representation from city-based authorities/stakeholders with meaningful powers for decision making.
Reducing harmful effects of transport on health and the environment and its contribution to climate change	- Have competent and efficient 'Vehicle Inspection & Certification Centers' operational in the city with enactment of supporting legislation preventing non-road worthy vehicles to ply in the city. - Have air quality and noise monitoring data collected on a regular basis from the streets to analyze trends that feed into actions taken. - A strict legal and procedural framework be designed and implemented to take action against relevant entities for provision of adulterated fuel.
Reducing car use, promoting public transport and facilitating non-motorized modes of transport such as walking, cycling	- Priority investment has to be on promoting non-motorized and public transit options where the highest priority user is the pedestrian - A 'Street Design Manual' be prepared and implemented to make the city streets capable of facilitating walkability, universal access, safety - There should be a process initiated for designing Multi-Modal Streets - Within the policy and planning process be incorporated the requirements of declaring Pedestrian Districts in the city - All BRT lines be linked with feeder 'bike sharing' options coupled with establishing Public Bicycle Stands in the city in strategic residential, commercial, recreational and institutional locations - Engage private sector through creating the enabling policy space to initiate projects/ programs for promoting cycling and related NMT uses - Engage the private sector to run Feeder/Inter-Modal services to extend excess of the BRT lines - A process of Mapping should be initiated to identify Walkable/Cycling routes in the city and for disseminating this information through use of mobile applications
Improving the safety and security of road users, particularly pedestrians, cyclists and public transport users	- Start an 'Accessible Streets' project (based on the recommendations of the Street Design Manual) - Over speeding or driving under the influence of alcohol should be made a much higher consequence crime in terms of penalties - In the BRT project special mechanisms, be incorporated addressing any act of sexual harassment, theft, pick pocketing etc.
Enhancing thorough increased access, public spaces, and commercial and economic activity	- Make it mandatory for land use planning to be integrated with the transport planning process - For each BRT line develop and implement a Transit Oriented Development (TOD) plan so that increased access leads to rejuvenation of public spaces, historical districts, institutional spaces, neighborhoods and employment spaces

Unpacking the Action Framework

The success of any public policy depends on the viability of the legal, institutional structures responsible for designing, implementing, regulating and evaluating it. In Karachi, as we have seen, there is no organism at the provincial or city level that is truly empowered for coordinating sustainable urban mobility. As such, it is highly unlikely that any interventions on ground can be sustained. There is a critical and urgent need to revisit the governance framework of the sector and through consensus restructure it. There has to be a suitable balance created in the roles and functions of provincial and local/city tiers of governance.

As mentioned in the Action Framework matrix, the SMTA can provide an umbrella framework for creating a suitably autonomous body structure that looks after transport for Karachi (and not just the BRT). SMTA Act would need to be revisited to give it a larger mandate, beyond just mass transit. Given the political realities in the province and the city, a workable balance has to be aimed at rather than alienating one or the other - province or the city.

A radical shift in priority focus in sector investment needs to be made that then provides a new prism with which to view future progress. That priority focus is a shift from private automobile friendly infrastructure development such as flyovers and street widening to pedestrian and NMT focused investment. This shift in priorities would require not only investing in different modes of transport, example public transit but redesigning and appropriating the city spaces differently. Streets have to be made suitable for walking, having universal access and safety provisions through having safe junctions and crossings and associated traffic calming measures.

Case Study -Health and environmental improvement

Private Sector Vehicle Inspection & Maintenance in Mexico City

Mandatory testing for vehicle emissions in Mexico City was introduced in 1988. Initially testing was done in government test-only centers as well as in private garages that were permitted to both test and repair. Although the private sector in Mexico undertook testing more economically, initially as many as 50 percent of vehicles were estimated to obtain passes falsely. A more limited number of private test centers were therefore subsequently licensed for testing only. The Mexican experience shows that an effective testing system must evaluate emissions levels accurately, and issue and enforce certificates without corruption. To achieve this, it is necessary that:

- The legal framework provides sanctions to be applied for failure to carry out the testing protocols correctly
- The testing stations must be subject to monitoring by independent bodies, and sanctions must be properly applied
- Repair work should be separate from testing
- The pass certificate must be easy to monitor
- There should be sufficient monitors (for example, traffic police) to ensure a low probability of evasion by vehicle owners
- The fine for not displaying a legal emissions test certificate should be sufficient to discourage evasion
- The technology of testing should exclude the possibility of temporary "tuning" to pass the test o The number of licensed centers should not be too large, to avoid garages being "soft" to increase market share
- All testing centers should be subject to rigorous implementation of protocols and inspection of their procedures.

Source: World Bank, 2001 (as cited in World Bank, 2002)

Public spaces have to be revisited to evaluate viabilities of 'pedestrianizing' market spaces, and historical districts. Neighborhoods have to be made safe for pedestrian movement. Efforts have to be made to discourage and reduce private automobile usage progressively. A critical shortcoming is the complete absence of coordination between land use development and transport planning. Presently, one aspect of development is impacting the other, without having positive synergies and the relationship is adding more miseries for the citizens. The transport and mobility sector has to be blended with an agenda for people friendly land use planning for social benefits and also for a strategic emphasis for economic revitalization of the city.

Systems and mechanisms have to be in place for creating an enabling space for productive models of public private partnerships to leverage the finances and expertise of the private sector. However, for that, capacity building of public bodies is essential in managing contracts and viable regulatory mechanisms have to be instituted. A lot can be gained by forging partnerships with civil society groups and communities, for example, in mobilizing citizens towards responsible ridership, working out a walking and bicycling agenda, reinvigorating our streets for healthy social engagements.

In London, Mayor Sadiq Khan's Transport Strategy pivots around his 'Healthy Streets' agenda. In the Foreword of his Transport Strategy of London, he writes, "London must become a city where walking, cycling and green public transport become the most appealing and practical choices for many more journeys. These active, efficient and sustainable transport choices not only support the health and wellbeing of Londoners, but also the city as a whole by reducing congestion and enabling the most efficient use of valuable street space." (MTS, 2018)

Case Study - Safety and security

As a planned new city, Brasília has an extensive road network, which in 1995 sustained an average traffic speed of 40 kilometers an hour (km/h), twice the national urban average, but which also experienced 11 deaths per 1,000 vehicles. On the recommendations of a joint working group of the secretariats of public safety and transport, in July 1995 the governor established by decree a traffic safety program, entitled "Peace within Traffic." The aims of the program included:

- Control of excess speeding
- Control of driving under the influence of alcohol
- Tighter traffic rules enforcement
- Improved medical assistance to accident victims
- Improved road infrastructure safety features
- Vehicle safety inspection and control
- Pedestrian, cyclist, and public transport priority.

Several secretariats were involved in implementing this high-level activity, which was supported by an energetic press campaign, as well as by intensive efforts to involve civil society. Between 1995 and 1997 the number of deaths per 1,000 vehicles fell from 11 to 6.6, and the emphasis and benefit has been subsequently maintained.

Source: Affonso, Rezende, and Vitor 1998 (as cited in World Bank, 2002)

Case Study - Non-motorized Transport

In year 2000 the municipality of Bogotá, Colombia, published a master plan for bicycles in the city. The plan includes the construction of 320 kilometers of cycle-ways over a nine-year period at an estimated cost of $120 million. It also provides for the necessary ancillary infrastructure, including bicycle parking, urban street furniture, landscaping, and traffic signals. The plan has been subject to detailed economic and environmental appraisals. For a shift in modal split to the bicycle of 2.5 percent, an economic rate of return of 15 percent was estimated. Higher shifts give correspondingly higher returns.

The launch of the first phase of the plan, for the construction of 200 kilometers of cycle track at a cost of $50 million, was accompanied by an ambitious marketing effort. This showed the program to be well integrated with parallel development of the TransMilenio urban public transport scheme and other transport facilities, as well as offered links to neighboring municipalities.

Source: Mauricio Cuellar, from local Bogotá press reports (as cited in World Bank, 2002)

End Note

Challenges are many for the policy makers and planners in Karachi. The complicated inter-governmental dynamics that presently exist limit possibilities of a desirable restructuring of the policy and institutional construct in the near future. Even if a restructuring takes place, there are serious constraints in terms of capacity. Then as has been discussed, the transportation and mobility sector can only deliver the larger dividends if it can find synergies with other development sectors related with land planning and management. The state of physical development and civic agencies in Karachi is characterized by fragmentations in their delivery systems, with the architecture of governance dysfunctional and in disarray - inappropriate placement of roles and functions, serious gaps in capacity and mechanisms of financial management represent some major aspects of the urban crisis. However, a beginning has to be made and it is felt that if properly managed, with appropriate rationalization of the existing inconsistencies, the Trans Karachi Breeze project can act as a trigger and catalyst to wider reforms.

As discussed in Section 4, the city of Bogota was also faced with a transportation sector in chaos within an overall urban governance framework that was challenged. However, with a visionary and energetic leadership provided by the Mayor of the city, the TransMilenio project was able to ignite the right triggers and mobilize both the citizens and the government machinery around the project that once properly implemented led to wider reforms that included a public space and health and well-being agenda being attached to the project.

The gaps in the Trans Karachi Breeze project have already been identified and need to be looked into. Leveraging of private sector, if properly managed can make up for gaps in capacity and financial management that the public institutions are challenged with. The vision has to be long term and approach strategic in order to reverse the downward spiral that engulfs our institutions and their mandated works.

It is clear that when we place the understanding of 'urban transport' within a larger construct of 'sustainable urban mobility' then the associated and expected dividends multiply. Its then not just about getting people from point A to point B but about rejuvenating the economy of the city, of combating the adverse impacts of climate change, of enhancing public health and well-being and as such, an urban mobility game plan if properly rolled out can have a transformative impact. This larger reform agenda needs to be spelled out to our policy makers so that they can be influenced to take the necessary actions. In this, civil society groups and media can play a vital role in mobilizing public opinion and exerting pressure for the required change.

This Strategic Roadmap identifies a number of 'actions' that holistically have the capacity to effect wider change. However, they would have to be categorized in terms of short, medium and long-term actions and other than agencies related with the transport sector, a number of other stakeholders also have to be a part of the reform process. A recommended task to be undertaken at the earliest is a rethink on restructuring the governance framework where to begin with the Trans Karachi Breeze project has to be sorted out. Models and successful case studies exist and some have been also highlighted in this study where policy makers under very trying circumstances have with a show of political will and by mobilizing a larger vision been able to reverse gear and deliver. Above anything else, this is what needed in Karachi; a show of political will and of developing a vision that all can share in and own.

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