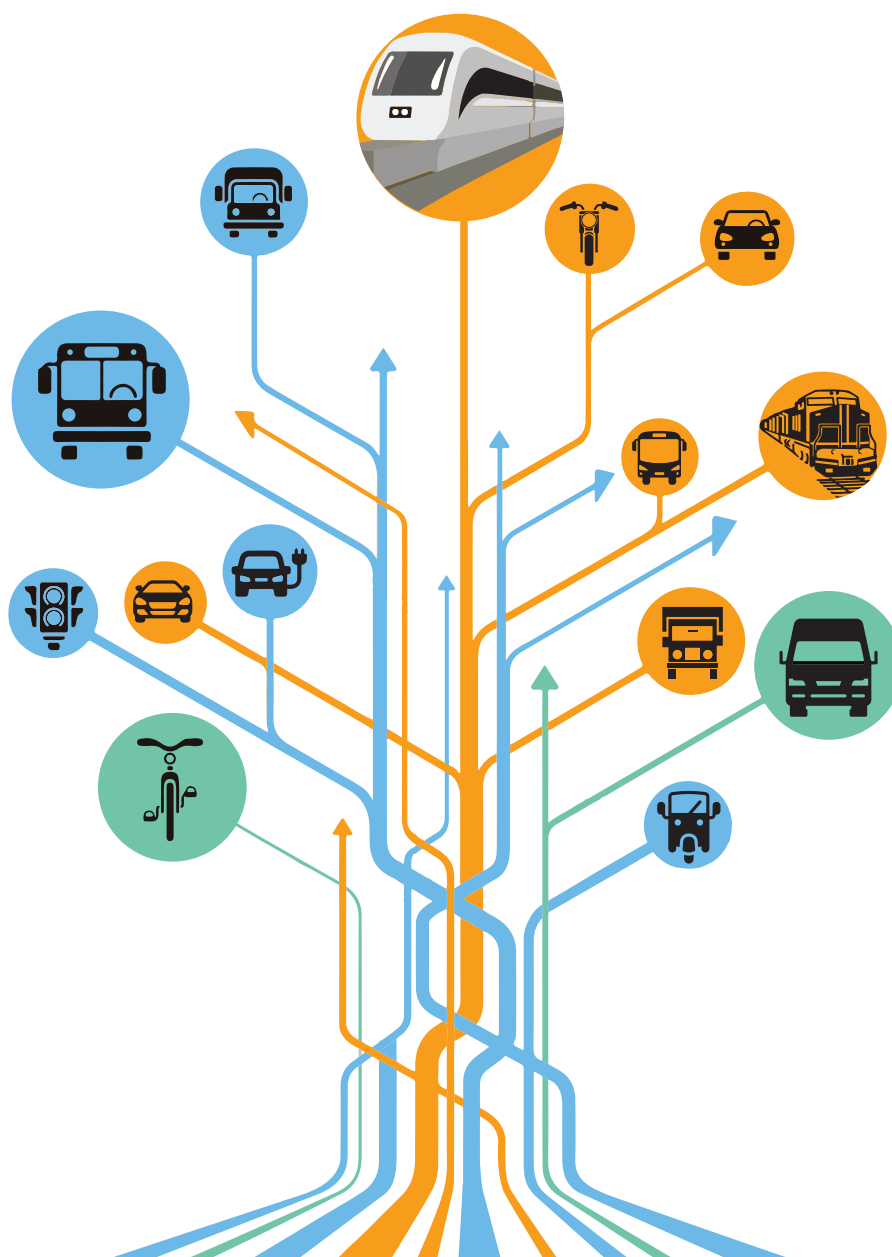




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TOWARDS A DEVELOPED URBAN TRANSPORTATION SYSTEM: LESSONS FOR SRI LANKA

BILESHA WEERARATNE
CHATHURGA KARUNANAYAKE



INSTITUTE OF POLICY STUDIES OF SRI LANKA



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Bilesa Weeraratne and Chathurga Karunanayake
June 2022



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List of Acronyms

BLT	Build Lease Transfer
BMCL	Bangkok Metro Cooperation Limited
BOT	Build Operate Transfer
BRT	Bus Rapid Transit
BTS	Bangkok Mass Transit System
BTSC	Bangkok Transit System Corporation
CMA	Colombo Metropolitan Area
CPI	Consumer Price Index
ECMT	European Conference of Ministers of Transport
GDP	Gross Domestic Product
GPS	Global Positioning System
GRDP	Gross Regional Domestic Product
JICA	Japan International Cooperation Agency
KCP	Kowloon Canton Railway
LC	Letters of Credit
LRT	Light Rail Transit
LRT1	Light Rail 1 (Metro Manila)
LRT2	Light Rail 2 (Metro Manila)
LRTA	Light Rail Transit Authority (Metro Manila)
LTV	Loan to Value Ratio
MRT	Mass Rapid Transit
MRT3	Mass Rapid Transit 3 (Metro Manila)
MRTA	Mass Rapid Transit Authority (Bangkok)
MRTC	Metro Rail Transit Corporation (Hong Kong)
MTR	Mass Transit Railway (Hong Kong)
MTRC	Mass Transit Railway Corporation
NPP	National Physical Plan
NPPPP	National Physical Planning Policy & Plan
NRMP	National Road Master Plan
OECD	Organization for Economic Co-operation and Development
OTCA	Overseas Technical Cooperation Agency
PNR	Philippine National Railroad
PPHPD	Passengers per Hour per Direction
PPP	Public-Private Partnership
RTS	Rapid Transit System
SLR	Sri Lanka Railways
SLTB	Sri Lanka Transport Board
TDM	Transport Demand Management
TSM	Transport Supply Management
UVVRP	Unified Vehicular Volume Reduction Program
WP	Western Province



Executive Summary

Better and improved transportation can enhance the lives of people, improve livelihoods and shape the form and function of cities. As such, well-equipped urban transportation is paramount for the progression of cities and, no city can be considered developed without an effective transportation system. Similar to elsewhere in the world, having a quality transportation system and prioritising transportation needs are vital to Sri Lanka in its path to development and the well-being of its citizens.

Usually, public transportation in Sri Lanka is facilitated by buses and trains. In 2017, public transportation accounted for only 41 per cent of transport and has been criticised for its inefficient and poor quality service. The public transportation system's inefficiencies and increasing income levels associated with demand for quality and comfortable transportation escalated private vehicle ownership. This situation has led to vehicles moving at slower driving speeds, resulting in unceasing traffic in urban areas.

The policy context for urban transport initiatives in Sri Lanka during the last decade clearly demarcates three periods. During pre-2015 period, transport-related programmes were carried out under the auspices of the development framework of the then regime; *Sri Lanka: The Emerging Wonder of Asia* development policy framework and *Unstoppable Sri Lanka 2020* strategy for public investment, while during 2015-2019, the transport-related projects were steered under the *Western Region Megapolis Transport Master Plan* from November 2019 onwards, the most recent initiative has been spearheaded under the national policy framework of the current regime; *Vistas of Prosperity and Splendour*. All three periods are connected broadly through the National Physical Plan (NPP), which is the only gazetted integrated planning document.

The NPP for 2011-2030 has identified strategies that incorporate integrated land use and infrastructure frameworks to enable Sri Lanka to regain its development and foster growth after the end of the civil war. While NPP for the period 2017 to 2050 has focussed on regulating and promoting urban areas with comprehensive development guidelines, the said plans will be varied out and implemented by the Urban Development Authority and other development agencies. While the two physical

plans have fundamental differences concerning its planning framework subject to prioritised areas during the two periods, when the strategies of the two documents are considered in their entirety, it suffices for the development of infrastructure and improved urban transportation for the country's future wellbeing.

However, despite a comprehensive planning context and a nuanced but somewhat consistent policy context, the progress made in public transportation in Sri Lanka is limited. Identifying crucial areas that can provide guidance and support for Sri Lanka's efforts can develop an improved urban transportation system. For this purpose, three case studies are examined, namely, Metro Manila in the Philippines, Bangkok in Thailand and Hong Kong. These three cities have

created mass transportation systems of their own, along with their share of positive and negative experiences in the process. As such, the lessons from the three case studies can be translated into the following recommendations to address some already experienced and potential issues in terms of developing public transport initiatives in urban Sri Lanka:

1. To garner the support of the government, opposition, and the public and create a master plan where public transportation is considered a system instead of a collection of projects; the document to be legally binding, which will exist regardless of the administration and would become more binding than the NPP.



- While this is ensured, it is also important that policy consistency exists from formulation to implementation of such plans.
2. Take advantage of the private sector and work on an optimal public-private partnership (PPP) to invest in transportation projects. Meanwhile, the government to retain the coordination and implementation role to ensure a systemic public transport development instead of piecemeal projects.
 3. Avoid vested interest and rent-seeking behaviour undermining the overall purpose and the plan of public transport initiatives.
 4. Estimate realistic projections about ridership in public transport modes/projects. Update and revise the same periodically with the latest information and address common factors that contribute to lower ridership.
 5. Design individual projects to integrate with other projects and modes of transportation and successfully diverting attraction from private vehicles to public transportation.
 6. To address public transportation issues, ensure policy coherence at the national level by vetting all policies for indirect implications; these include mitigating traffic congestion, reducing private ownership of vehicles, and attracting commuters to public transportation.



1. Introduction

“An advanced city is not one where even the poor use cars, but rather one where even the rich use public transport.”
(Peñalosa, 2013)

Cities are remarkably dynamic in its nature. The concentration of people in fairly limited spaces brings specific opportunities and challenges for urban societies owing to the broad spectrum of derived demands generated overall by all urban activities. Among these demands, transport remains one of the most relevant and visible. According to the World Bank (2018a), better and improved transportation can enhance people's lives and improve livelihoods through facilitating access to jobs, markets and essential basic services, such as health care and education. Simultaneously, transportation shapes the form and function of cities and has become a pressing issue in the development process of many large and medium cities around the globe (Kenworthy, 2019; Concha, 2018). Therefore, well-equipped urban transportation is paramount for the progression of cities and, no city can be considered developed without an effective transportation system.

Like any other country in the world, having a quality transportation system is vital to Sri Lanka's development and the well-being of its citizens. Sri Lanka currently has four major modes of transportation - road networks, railway transport, sea transport and air transport, and consists of a well-laid out transport network which originated in the 19th century. Transport activity since independence has been rising at 5 per cent per year, with a per capita increase of around 4 per cent per year (ADB, 2012). In 2010, road transport accounted for 93 per cent of passenger travel and 98 per cent of freight transport while buses carried 61 per cent of the passengers, while para-transit in the form of three-wheelers and taxis made up another 6 per cent (ADB, 2012). By 2017, the modal share of bus transportation was 39 per cent (National Physical Planning Department, 2019). Sri Lanka constitutes an operational fleet of over 5 million vehicles, out of which only about 25,000 are represented by public transportation buses, while

buses carry over 3.2 billion passengers (CBSL, 2019 a). By 2031, the estimated daily average road speed is 19 km/hour, compared to 26 km/hour reported in 2011. This is estimated to further decline to 11 km/hour during peak hours (MCC, 2017).

Transport activity in Sri Lanka is most dominant within Colombo City and its environs. An estimated 60,000 vehicles per day enter Colombo City and transport nearly 1.9 million passengers (Sandaruwan, Karunaratne, Edirisinghe, & Wickramasinghe, 2019; Daily Mirror, 2019). Out of this, 52 per cent of passengers commuted by public transport and 44 per cent by private vehicles, while 87 per cent of vehicles (overall) that entered Colombo are privately owned. As cited by Kalahe & Mudunkotuwa (2020), the share of public transport declined from a share of 67 per cent in 2013 to 58 per cent in 2014. Furthermore, the city's travel demand is rapidly escalating due to increased mobility of people and a high number of privately owned vehicles, while the share of public transport is on a rapid decline (Pera, 2014). The daily average road speed for the Colombo district is estimated to decrease from 22 km/hour to 14 km/hour between 2011 and 2031, while the peak hour speed is forecast to be as low as 9 km/hour by 2031 (MCC, 2017). Nevertheless, as reported by Daily Mirror (2019), in 2019, the peak time speed in Colombo had already dropped to 8 km/hour.

At present, Sri Lanka is gearing up to transform Colombo into an international commercial and financial hub (Ministry of Finance, Sri Lanka, 2019). However, given that there is still room for improvement in the urban road network in Sri Lanka, especially in the Colombo Metropolitan Area (CMA), the government recognises the need for an effective, efficient and environmentally friendly transportation system to make the transformation successful. This includes developing the transpor-



tation systems in the major cities by improving the road and railway network and enabling efficient public transportation while addressing pressing issues in the sector. For this purpose, a part of this strategy has incorporated; (a) introducing a Metro Rail system (through developing a Light Rail Transit (LRT)), (b) curtailing the traffic congestion in Colombo by 50 per cent through the introduction of a radial and circular road system while adding sky bridges, vertical parking lots and flyovers in key areas (c) improving overall infrastructure and maximising the available space in the Colombo city limits, and (d) improving public transport services including buses and train services and ensure comfortable travel.

In this light, this paper seeks to learn from the experiences of other countries, to improve public transportation in urban Sri Lanka. For this purpose, the present study adopts a case study approach and examines the transport initiatives adopted in Metro Manila in the Philippines, Bangkok in Thailand and Hong Kong.

Metro Manila and Bangkok are examined in this study due to their similarity to Colombo and the Western Province (WP) in Sri Lanka regarding traffic congestions for decades. In addition, the Philippines and Bangkok are known for their successful efforts in addressing these issues, such as establishing a LRT system that provides vital insights in overcoming prevailing issues in Sri Lanka's urban transport system. Additionally, the biggest impediment to Metro Manila's successful public transportation development is the adverse political environment and wandering political direction, which is similar to what critics cite as one of Sri Lanka's barriers for the continuation of a development strategy. Therefore, it is essential to study what Manila has done to overcome their government's inaction to identify any potential hints/instructions it can offer to develop Sri Lanka's transport sector.

Bangkok holds a similar position in Thailand as Colombo does in Sri Lanka, with a relatively high Gross Domestic Product (GDP) per capita and a significantly high population density than the rest of the country. As such, it makes Thailand a reasonable comparator to Sri Lanka in terms of feasibility. Hong Kong is considered a case study due to having one of the best transportation systems globally. It is noteworthy that there are significant differences between Hong Kong and Sri Lanka, making it challenging for Sri Lanka to fully emulate Hong Kong's experience.

However, empirical evidence widely proves that Hong Kong is an ideal case to offer lessons from their best practices to any city struggling to develop its transportation system. As such, the choice of these three cases was intentional. By reflecting on these case studies, Sri Lanka can benefit from both positive and negative experiences and avoid re-inventing the wheel and instead can customise their experiences to develop an effective urban public transportation system.

The remainder of this paper is organised as follows. Section 2 reviews existing literature and lays out the framework of analysis. Section 3 discusses public and private transportation aspects in the context of Sri Lanka and subsequently draws attention to challenges in urban transportation. Section 4 examines the policy context followed by the planning context in Section 5. Section 6 analyses three case studies from Asia and draws attention to the lessons Sri Lanka can learn. Section 7 concludes the paper with a series of recommendations for the way forward.



2. Literature Review

Currently, more than half of the world's population lives in cities and projections indicate that urban areas will account for 60 per cent of the global population by 2030 (Goetz, 2019). Research also proves that with the growth of cities in terms of their population and land use, the growing population in cities is straining urban transportation systems (ESCAP, 2018).

The recent pace of urban growth in developing countries, especially in Asian countries, is much faster, than it was in Europe a century ago. Hence, urban transportation in developing countries is a major policy concern, whereas inefficient transportation creates inefficient cities and thereby inefficient countries (Boquet, 2010). Moreover, people's accessibility to cities and its services widely rely on transportation infrastructure and connectivity thus, transportation plays a decisive role in developing the urban areas (CEPA, 2015). This review focusses on the main challenges for urban transportation and attempts to identify possible solutions based on existing literature.

2.1 Traffic Congestion and Other Issues

Research suggests many challenges that restrict efficient and smooth transportation in cities, often out of which traffic congestion remains to be the main concern. For instance, according to the World Bank (2002), traffic congestion caused by the increase in ownership of motor vehicles and growth in vehicle usage that outruns the population growth is a common issue faced by many countries today. As a result, this growth outruns the ability to increase road capacity, leading to road traffic congestions (Global Traffic Scorecard, 2019).

As asserted by Narayanaswami (2016), traffic congestion is generally caused by automobile dependency, poor quality of infrastructure, high cost of travel, insufficient parking spaces and unsatisfactory public transportation system that fail to meet the demand of its riders leading to a pressing issue in urban transportation. Furthermore, research shows that most of the cities in Asia similar to many other cities in the world, face a major dilemma concerning spiralling traffic problems, deteriorating public transport service and a lack of investment funds (Barter, 2000).

Therefore, congestion can be perceived as a symptom of deeper problems rather than the primary issues to be tackled directly. As the ESCAP (2018) highlighted, urban centres play a dominant role as transport hubs. Dealing with issues related to urban transport is complex due to diversified operating modes, various travel patterns, and the magnitude of traffic volumes.

2.2 Improving Public Transport

Prevailing research shows that controlling urban traffic is intimately linked to enhancing public transport, easing traffic congestion, and addressing other issues such as social exclusion in cities (Hajduk, 2017; Barter, 2000). Similarly, Sun, Chen, Zhang, and Huang (2018) affirm that equal access to public transportation is essential for a sustainable urban traffic system. Moreover, adequate public transport not only serves to reduce reliance on private car-ownership, which reduces congestion but also provides an affordable alternative for urban commuters (Salau, 2015). Furthermore, according to Kumaraige (2004), having quality public transport that suits the density of the population is the backbone of an efficient and sustainable transport system. As such, public transport strategy will be beneficial under two aspects.

Firstly, it will be favourable for managing transport provided it suits the population density. Secondly, it suits the personal income of passengers. With regard to the former, public transport is a viable solution and a vital mode of transport in terms of a situation where the density of population is high and the density of roads is low. In such a situation, public transport plays a pivotal role in terms of ensuring sustainable transportation. The latter case, which is having new modes of public transport that suit the income level of the people, will also be fruitful in the long run. Having public transport with adequate quality will appeal to people with high-income levels who can afford a private vehicle in place of travelling in public buses and trains. If passengers who can afford a vehicle do not find comfort in public transport, then their need to own and use a private vehicle would prevail while their demand for public transport would remain unchanged.

Therefore, in an urban context, efficient public transportation is a key service that directly affects the lifestyles of any social stratum whether that individual can afford a private vehicle or not, as they will be victimised by transportation issues such as traffic congestion and poor infrastructure in the same way but at different levels. Existing research indicates that certain cities in Asia such as Hong Kong and Seoul have been hailed as success stories in public transportation, while in other cities such as Kuala Lumpur, issues in transportation are threatening environmental sustainability, safety, economic performance and even development goals (Barter, 2000). Therefore, it is imperative that we learn from both successful and unsuccessful experiences and future attempts to address issues in public transportation.

2.3 Transportation Supply Management (TSM)

The short-term strategy for managing traffic congestion involves two distinct approaches with special focus on supply and demand of transportation. One way of managing transport supply is by adding new transport infrastructure capacity. According to Victorian Auditor-General's Report (2013), supply-side factors that seek to relieve congestion include expanding the capacity of prevailing roads, introducing new roads and expanding the public transport capacity. Goetz (2019) distinguishes two approaches to adding new transport infrastructure capacity. These are the 'incremental progress' approach and the 'magic bullet' approach, where the former focusses on the expanded development of multimodal mass transportation technologies through local buses, express buses, bus rapid transit, commuter rail, subways, Light Rail, trams/streetcars, jitneys, ferries as well as walking and cycling, and discouraging single-occupant automobile use. This incremental progress approach is expected to accommodate the growing number of passengers and freight movement in cities.

The magic bullet approach focusses on the improvements that could be realised through new technological advancements. As the "growing frustration with worsening congestion, delays, and costs of contemporary urban transportation have led to the search for the magic bullet – the golden set of technologies that will solve urban transport problems in one fell swoop" (Goetz, 2019, p. 702). In this regard, Barter (2000) suggests introducing smart highways; Light Rails and multilevel or underground roads, and parking. However, adding new trans-

port infrastructure capacity is an expensive approach. It offers only a short-term solution, as it may also generate more traffic in the long run (Kumarage, 2004). As such, for cities with relatively higher incomes, moderate densities and smaller population sizes, Barter (2000) identifies that high investments into roads and low-density suburban development allow a car-dependent city to emerge.

Apart from adding new infrastructure, other key ways to manage transport supply include (a) improving road infrastructure, (b) utilising subway systems that will enable the commuting of most number of passengers and (c) managing transportation system through identifying the traffic conditions (United Nations, 2003). The last point includes identifying whether the streets have one way or two-way traffic, whether traffic lights are synchronised, the know-how on the average occupancy of vehicles, and if the buses are given priority on the roadway. Mechanisms to improve road infrastructure include ensuring better police enforcement of road traffic; introducing one-way systems that reduce conflicts in traffic; expanding public transportation system and introducing bus lanes; and making operational improvements to existing infrastructure (Kumarage, 2004; United Nations, 2003). As such, the Organization for Economic Co-operation and Development (OECD) and European Conference of Ministers of Transport (ECMT) (2007), suggest managing transportation supply through means of identifying bottlenecks and expanding the capacity of roadway networks.

2.4 Transportation Demand Management (TDM)

In addition to supply management, TDM plays a crucial role as a short-term strategy for managing congestion and easing mobility. As identified by literature, TDM is a strategy, which maximises the efficiency of the urban transport system by discouraging unnecessary usage of private vehicles and encouraging more effective, healthy and environment friendly modes of transport such as public transport and non-motorised transport (Broadbuss, Litman, & Menon, 2009). One such approach to reduce the impact of traffic flow through TDM is re-distributing the spatial form of the demand for transport through urban re-planning and relocation of certain land uses (University of Moratuwa, 2000).

In addition, demand spreading or spreading the traffic during peak hours (also known as re-distribution of the temporal pattern of the demand for transport) and re-dis-



tribution of demand between different modes of transport such as diverting those using private vehicles to use public transport can also be adopted (Karoń, 2018). Literature notes that the aforementioned approach will have a significant impact on managing traffic and will be effective if both the quantity and the quality of public transportation are enhanced, road tolls are imposed and parking charges are increased (Wu, Pei, & Gao, 2015). Kumarage (2004) notes that this approach is highly favourable when people are induced to move from high space utilising vehicles such as cars and motorcycles to low space utilising vehicles such as buses and trains.

Another TDM measure is redesigning cities as walking or compact cities where distances between work and home are reduced, thereby discouraging using motor vehicles for commuting. Finally, developing detailed traffic plans that set areas as car-free zones, having parking limitations and developing long-term public awareness campaigns and pilot projects will also lead to TDM (World Bank, 2012). However, the economic burden of costs pertaining to TDM strategies such as road pricing, fuel taxes or parking charges broadly depends on the availability and accessibility of the alternatives, such as quality public transport and a safe environment for non-motorised modes of transportation in the forms of cycling and walking (Barter, 2000).

2.5 Land Use and Vehicle Ownership Strategies

The long term strategies for managing traffic congestion include land-use strategies and vehicle ownership strategies. In recent years, the linkage between transportation and land use has gained much attention. Mohan & Tiwari (2000) identify four patterns of land use as (a) demographic projections and decisions regarding the level at which the population will be contained (b) allocating population to various zones based on density levels, infrastructure capacity and future density levels, (c) land-use zoning to ensure the desired allocation of population and activities are met as projected and (d) acquisition of land in a large scale with the purview of achieving the planned development. The introduction of efficient land use strategies could develop an urban area in such a way as to locate jobs, schools, and shopping centres, etc., nearby to minimise the use of transportation. These mechanisms would cause traffic demand to fall, thereby enabling demand for a transportation system to meet the supply. A successful land-use strategy

requires government commitment, drawing up a plan for the future and steering through until their implementation (Kumarage, 2004).

Vehicle Ownership Strategy is another long-term approach to addressing congestion. The rise in vehicle ownership generally requires more road space, parking space and measures to control environmental effects. Thus, the correct level of vehicle ownership must be assessed and planned accordingly. Vehicle ownership has a direct linkage to traffic congestion, as the available road space cannot match the demand that these vehicles generate. For instance, Bangkok had to face a 'traffic disaster' owing to the increase in motorisation in a dense city. This condition resulted from unrestrained motorisation in the dense saturated bus cities. In addition to the issue of traffic, increased motorisation has created issues regarding pollution, urban decay and stagnation of the city. It has also resulted in the proliferation of small motorcycles as the only viable mode of transportation and creating a situation where reaching a transit-oriented strategy is extremely hard (Barter, 2000).

Thus, more interventionist policies need to be proposed to control vehicle ownership so that the current stock of vehicles utilised for commuting would suit the road capacity. Some strategies to ensure that the prevailing stock of vehicles is compatible with road space include measures to manage the ownership and use of private vehicles through tolling and congestion pricing while maintaining the public transport share (Kumarage, 2004). In the case of South Korea, some of the specific policies have been successful in restricting private vehicle ownership include restraining ownership and car use through high gasoline prices, a high yearly car ownership tax, and low availability of credit for private consumption (Jeon, Amekudzi, & Vanegas, 2006).

The foregone literature review shows that issues of urban transportation are interlinked. Growing cities and populations often strain structural shortcomings such as poor public transportation and inadequate transportation infrastructure. The inability of these existing infrastructures to adapt to rapid urbanisation results in heavy traffic congestions is exacerbated by the increased use of private vehicles. Thus, many transportation issues collectively impact and lead to congestion, making it a symptom of weak and failing infrastructure overall.



This study considers traffic congestion as the key/critical challenge to urban transportation. Many solutions can remedy urban transportation issues. These include both supply-side strategies that work to improve transport infrastructure through the creation of highways and the introduction of innovative modes of transport, as well as demand side strategies such as toll roads and parking charges.

Beesley and Kemp (1987, p. 1026) succinctly echo the above as “the investigation and analysis of consumer and supplier decision making in urban transportation is complicated...” and identify Urban Transportation Planning (UTP) framework as a valuable methodology for urban transportation analysis. When summarised, the UTP includes a demand component which is also called the prediction impacts of sub models dealing with trip generation, zonal interchange distribution, modal characteristics, and route assignment. These sub models are considered sequentially in the UTP framework to affect consumer choice. On the supply side of the UTP, large infrastructure investments are determined exogenously based on land use patterns, population distribution, transportation system service, price and cost characteristics. The UTP model’s equilibrium is calibrated by the internal iteration of traffic volumes and speeds within the route assignment sub model, and feedback speed/travel time through one or more of the earlier sub models. Adopting this UTP framework, the remainder of this study focusses on the case studies of the transport initiatives in Metro Manila, Bangkok and Hong Kong to learn from the multitude of interventions that can be implemented to reduce congestion and other issues with urban transportation in Sri Lanka.



3. Transportation Context in Sri Lanka

3.1 Poor Public Transportation

Generally, public transportation in Sri Lanka is facilitated by buses and trains. The country's railway network is solely operated by Sri Lanka Railways (SLR), while Sri Lanka Transport Board (SLTB) and many private bus owners provide passenger bus services. In 2019,

2016; CBSL, 2015; Wijerathna, 2016). In the case of rail transportation, key weaknesses are the delays involved and the quality of trains. For instance, in 2018, "48.4 per cent of the trains were not operated punctually and 7.5 per cent of the trains have been delayed by more than [an] hour". At the same time, around 65 per cent of the train fleet owned by SLR are over 30 years old (CBSL, 2019, p. 115).

Table 1: Bus and Rail Passenger Transportation in Sri Lanka: 2015-2019

	2015	2016	2017	2018	2019	Average
Sri Lanka Transport Board Buses						
Operated km million	440	452	448	446	431	443
Passenger km million	15,210	16,101	15,810	15,541	12,012	14,935
Private buses						
Operated km million	1,000	1,031	1,000	1,100	1,100	1,046
Passenger km million	51,100	52,100	50,800	55,400	54,200	52,720
Sri Lanka Railways						
Operated km '000	11,797	11,921	11,679	11,640	11,700	11,747
Passenger km million	7,407	7,413	7,495	7,710	7,310	7,467
Freight ton km (million)	130	140	145	120	116	130

Source: SLTB, various years; Ministry of Transport and Civil Aviation, various years & CBSL, various years.

the total distance operated by both types of bus operators was 1.5 billion km and the total passenger kilometres operated was 66.2 billion km. In the case of SLR, in 2019, the distance operated was 11.7 million km. The passenger kilometres served by SLR was 7.3 billion km and the total freight ton kilometres served was 116 million (see Table 1).

In 2017, only 41 per cent of transport was using public transport (buses and trains) (National Transport Commission, 2017). The public transport sector in Sri Lanka has been criticised for being inefficient and poor in service quality. In this regard, some of the key weaknesses include the insufficient number of bus turns, poor information sharing system, inefficient complaint management, poor facilities and the maintenance of bus stops and terminals, overcrowding, cost and ticketing process, lack of cleanliness of buses, poor road infrastructure, limited inter-modal connectivity, lack of parking facilities for bus transport users, and low service quality (CBSL,

3.2 Dynamics in Ownership of Private Vehicles

The inefficient public transportation system in the country has resulted in an escalation on the private vehicle registration, despite high taxation and other public policy measures, to cater to the increasing income levels and the associated demand for quality and comfortable transportation (CBSL, 2019; National Intellectuals Organization (NIO), 2019). Sri Lanka's public transportation systems do not meet the changing demands in the economy for good quality and cost-effective public transport systems (CBSL, 2019). As such, the high-income elasticity and the willingness to pay, fuelled by the availability of vehicle leasing facilities and loans (until recently), have created an aversion towards the use of public transportation. Table 2 shows that in 2015, motorcars –used for private use and three-wheelers were allowed to obtain leasing facilities up to 70 per cent of

the value of the vehicle, until it was revised to 50 per cent and 25 per cent respectively, from 2017 onwards. As such, even after the Loan to Value Ratio (LTV) underwent a downward revision, still the new registration of motor vehicles increased by 6.5 per cent in 2018 to 480,799 before it declined by 23.5 per cent in 2019 (Central Bank of Sri Lanka, 2018a).

as favourable duty structure, increase in disposable income, low-interest rates for vehicle leasing, and relatively low taxes on hybrid, electric vehicles and motor cars with an engine capacity of less than 1,000cc largely attributed to the increase in vehicle registrations. When vehicle registrations declined (for example; in 2012, 2013, 2016, 2017 and 2019), it is evident that higher import

Table 2: Loan to Value Ratios for Credit Facilities for Motor Vehicles 2015-2019

Vehicle category	LTV Ratio			
	2015	2017	2018	2019
Commercial Vehicles	-	90	90	90
Motor cars, SUVs, and Vans	-	50	50	50
Three-wheelers	-	25	25	25
Light trucks	-	-	-	90
Any other vehicle	-	70	70	70
Hybrid motor cars, SUVs, and Vans	-	-	70	50
All vehicles	70			

Note: LTV ratios for non-electric vehicles.

Source: CBSL, various years.

In this context, during the last decade, fluctuating performance in new registrations can be noticed (see Table 3). Some of the key reasons behind these fluctuations from 2010 to 2014 include recovering from the civil war/ conflict, lower import duties, growth in real income levels, low interest rates, granting of permits to import motor vehicles at concessionary tax rates to public servants, favourable interest rates on leasing facilities, and the depreciation of Japanese Yen against the Sri Lankan Rupee. In 2015 and 2018, budgetary concessions such

duties, the revision of taxes on motor vehicle imports, depreciation of the domestic currency against the US dollar, the macro-prudential measures implemented by the Central Bank of Sri Lanka (CBSL) and the gradual increase in interest rates have contributed to the deceleration in registration of new vehicles. In 2019, an overall decline in the registration of new vehicles was observed. Nevertheless, notable variations occurred within the year. In the first half of 2018, registrations dropped mainly due to policy measures imposed by the CBSL

Table 3: New Registration of Motor Vehicles 2010-2019

	2010	2011	2012	2013	2014	2015	2016	2017	2018 (a)	2019 (b)
Total	359,243	525,421	397,295	326,651	429,556	668,907	493,328	451,653	480,799	367,303
Buses	2,491	4,248	3,095	1,805	3,851	4,140	2,685	3,331	2,957	1,613
Motor cars	23,072	57,886	31,546	28,380	38,780	105,628	45,172	39,182	80,776	38,232
Three wheelers	85,648	138,426	98,815	83,673	79,038	129,547	56,945	23,537	20,063	15,490
Dual purpose	11,712	33,518	37,397	24,603	20,799	39,456	26,887	16,742	16,931	13,459
Motor cycles	204,811	253,331	192,284	169,280	272,885	370,889	340,129	344,380	339,763	284,301
Goods transport	11,845	14,818	12,266	5,872	5,121	7,142	7,563	11,432	9,371	5,223
Land vehicles	19,664	23,194	21,892	13,038	9,082	12,105	13,947	13,049	10,282	7,666
Quadracycles & motor homes	-	-	-	-	-	-	-	-	656	1,319

Source: (CBSL, 2019; Department of Motor Traffic, 2020).



and the government to curtail vehicle imports. However, by mid-2019, abolishing of restrictions such as the margin deposit requirements and relaxing restrictions on the opening of Letters of Credit (LCs) for the importation of motor vehicles under concessionary permits led to a gradual increase in vehicle registrations in the second half of the year (CBSL, 2019).

3.3 Traffic Congestion – The Case of WP

In the WP, an estimated 7.8 million motorised trips took place daily (Ministry of Megapolis and Western Development, 2016). Over half the trips occurred with public transportation and estimates on the use of public transportation ranged between 58 per cent and 51.5 per cent, while the rest of the trips used private transportation (Ministry of Megapolis and Western Development, 2016; Ministry of Transport, Sri Lanka, 2014). In 2016, the average speed of a trip within the WP was 17 km/hour that dropped to 12 km/hour within the Colombo municipal limits (Ministry of Megapolis and Western Development, 2016). During peak times, the speed in major corridors has fallen to less than 10 km/hour (Ministry of Transport, Sri Lanka, 2014).

Reports further indicate that within the Colombo Business District (CBD), where the demand for the existing transportation services exceeds supply, the traffic reached a virtual standstill during peak times (Ministry of Megapolis and Western Development, 2016). The latest estimates indicate that by 2031, the daily average road speed in Colombo District would be 14 km/hour, while the peak hour speed would fall to 9 km/hour (MCC, 2017). Indicating concerns if this threshold reaches earlier than projected, the latest unsubstantiated estimated that in 2019, the peak time speed in Colombo had already dropped to 8 km/hour (Daily Mirror, 2019).

Jayasooriya and Bandara (2017) affirmed that the economic cost of traffic congestion is one of the most con-

tentious issues in an economy as it symbolises economic inefficiency. Such traffic congestions lead to inefficiencies due to its negative impacts, such as interruptions to the production process, reductions in productivity levels, and increased loss in labour time.

Various estimates quantify this cost of traffic congestions. In 2009, Kumaraage estimated both the loss of productivity, fuel cost and wear and tear on the car due to congestion in Colombo and its suburbs and determined that the total cost to the economy was LKR 32 billion per year (USD 221 million) (Business Times, 2011).

“The latest estimates indicate that by 2031, the daily average road speed in Colombo District would be 14 km/hour, while the peak hour speed would fall to 9 km/hour (MCC, 2017). Indicating concerns if this threshold reaches earlier than projected, the latest unsubstantiated estimated that in 2019, the peak time speed in Colombo had already dropped to 8 km/hour (Daily Mirror, 2019).”

In 2014, the estimated cost of the loss of productivity due to traffic congestion in the CMA was LKR 12 billion (USD 83 million) per annum (Ministry of Transport, Sri Lanka, 2014). Adopting a broader scope, the Ministry of Internal Transportation focussed on the entire WP as opposed to the smaller CMA, calculated the total cost for providing transportation (as opposed to estimating the additional cost caused by the traffic congestion).

Their estimation also considered vehicular wear and tear, productivity losses, traffic accidents costs, and environmental costs. This broader estimate of the overall cost of providing mobility in the WP stood at LKR 349 billion per year (USD 2.4 billion), which was about 10 per cent of the GDP of the WP (Ministry of Internal Transport, 2015).

Furthermore, heavy traffic increases the likelihood of road accidents. In 2017, 36,599 road accidents were reported to the Sri Lanka Police, with 3,147 deaths and 33,452 injuries. Out of these road accidents, 4,545 amounting to over 12 per cent, were reported in the Colombo city limits (DCS, 2018).

In addition to the aforementioned issues caused by traffic congestion, problems in transportation in the WP include lack of feeder service to railways, insufficient integration among the public transportation, slow operation, lack

of access to the international airport, insufficient road space, lack of pedestrian space, and traffic congestion at intersections.

Another serious concern of traffic congestion is pollution, which probably results in air quality deterioration and health issues which affect the overall economic conditions. For instance, as Premasiri, Jayawardhane, Jayarathne, & Rajapaksha (2014) asserted, in WP, while the pollutant levels are comparatively high in highly congested areas, these are related to vehicular density. Furthermore, the Energy Sector Management Assistant Program (2015) points out that failing to have energy-efficient transport solutions will worsen this issue as the population of the WP is expected to rise from 5.8 million to 8.7 million by 2035. However, their study emphasises that better connections between Sri Lanka's existing railway and bus networks probably attract more people to use public transportation. Thereby, lower carbon emissions from private vehicle usage are estimated to be 18,000 tons of carbon dioxide in 20 years (Energy Sector Management Assistant Program (ESMAP), 2015).

If not addressed promptly, traffic congestion and related issues in the WP would continue to grow, as many different factors contribute to escalating traffic in the WP. The first factor is the increasing population. In 2018, the estimated mid-year population in the WP was 6.1 million, while the population in the Colombo district was 2.4 million (Central Bank of Sri Lanka, 2018b). By the year 2035, the population in the WP is estimated to rise to 9.1 million, while the population of the Colombo Metropolitan area is expected to rise to 5.1 million (Japan International Cooperation Agency Oriental Consultants Co. Ltd, 2014).

Concurrently, the working population in the WP is expected to grow beyond 2.75 million by 2035. (Japan International Cooperation Agency Oriental Consultants Co. Ltd, 2014). This kind of population growth would challenge the already inadequate public transportation system as well as the congested road capacity in the WP. Another factor affecting intensifying traffic in this region is the increasing wealth of the population, which contributes to changing commuters' preferences and affordability for private vehicles. In 2003, the mean and median income per month per household in WP was LKR 25,602 and LKR 17,810, respectively, while the corresponding national figures were LKR 17,109 and LKR

11,350, respectively. By 2016, the mean household income per month in the WP had risen to LKR 84,231, while the median was LKR 57,514, and the corresponding national figures were LKR 62,237 and LKR 43,511, respectively.

Mirroring this trend, between 2000 and 2018, the number of vehicles in the WP surged from 1,075,099 to 1,557,983 (CBSL, 2019 a; CBSL, 2011). Concurrently, the share of public transportation for the WP calculated as 67 per cent dropped to 51 – 58 per cent by 2013 (Ministry of Transport, Sri Lanka, 2014, p. 2). In 2018, signifying the high proportion of vehicles in the WP, the latter accounted for over 40 per cent of revenue collected as Motor Vehicle Revenue License Fees (LKR 4.25 billion) (Finance Commission, 2018). The Ministry of Transport, Sri Lanka (2014) estimated that if no action is taken, the number of car trips in the WP will grow six times in the next 30+ years, causing more congestion, loss of productivity, and environmental degradation.

The longer the condition in the WP and Colombo is allowed to deteriorate, the harder it will be to remedy the situation. If not addressed speedily, the traffic in WP will worsen and would require more significant funds and effort to fix the problem (Japan International Cooperation Agency Oriental Consultants Co. Ltd, 2014).

The literature identifies short-term and long-term options to address these issues. Short-term strategies include Transportation Supply Management (TSM) and TDM, while long-term solutions require more comprehensive strategies and broad policies that go hand in hand with transport and road capacity, population density, and personal incomes. Moreover, Kumaraage (2004) underscores the importance of integrated and inter-linked policy approaches to address these issues. Kumaraage (2004) further stresses the importance of compatibility and identifies that land-use strategy aimed at targetting transportation issues should be compatible with transport capacity; vehicle ownership strategy should be compatible with road capacity; public transportation strategy should be compatible with population density; and strategies for new modes of public transport should be compatible with personal incomes. Adopting such an inter-linked approach, the most suitable strategy for Sri Lanka would be a mixture of both short and long-term strategies, where immediate respite and permanent solutions are initiated together (Kumaraage, 2004).



In addition to the above challenges, the absence of a transport plan, failure to have integrated multi modal transport solutions in place, and policy overhauls with every change of government are pressing issues in the development of urban transport in the country (Kumara, 2017). Furthermore, resorting to very costly projects by using borrowed funds in an ad-hoc manner and relying on foreign experts for feasibility studies, while side-lining local experts who are capable of similar analysis at a relatively lower cost are other issues in the im-

plementation of transport projects (Mohan S. R., 2020). Additionally, opting for the wrong choice of service providers at a very high cost and opting for negotiated and non-transparent government-to-government contracts will hardly assist in covering the costs (Gunaruwan (2015). These would ultimately undermine the overall purpose of public transport initiatives in the country. As such, these are crucial challenges to be addressed in the transport sector (LBO Infrastructure Summit, 2015).

“In addition to the above challenges, the absence of a transport plan, failure to have integrated multi modal transport solutions in place, and policy overhauls with every change of government are pressing issues in the development of urban transport in the country.”



4. Policy Context

The policy context for urban transport initiatives in Sri Lanka during the last decade clearly demarcates three periods, namely pre-2015, 2015-2019, and 2019 onwards, mirroring the changes in political regimes. During the pre-2015 period, transport-related programmes were carried out under the auspices of the development framework of the then regime; *Sri Lanka: The Emerging Wonder of Asia* development policy framework and *Unstoppable Sri Lanka 2020* strategy for public investment, while during 2015-2019, transportation-related projects were steered under the *Western Region Megapolis Transport Master Plan*. From November 2019 onwards, the most recent initiative has been spearheaded under the national policy framework of the current regime; *Visitas of Prosperity and Splendour*.

4.1 The Emerging Wonder of Asia - Unstoppable Sri Lanka: 2010 – 2015

Under the development framework of *The Emerging Wonder of Asia*, which was in effect from 2010-2015, the main emphasis of the government's development policy framework was to make Sri Lanka a regional transportation hub. Accordingly, mega development projects were prioritised. Additionally, a concurrent vision for a greener Sri Lanka has been proposed, which would have minimised private vehicle ownership while improving the usage and attractiveness of public transportation.

Within this framework, a few priority areas focussed among other concerns were improving transportation, infrastructure and services, utilising existing resources, providing a choice of modes of transport and creating competitiveness among modes.

As such, the policy focus in 2010-2015 mainly involved improving public transportation and TSM. Within these priorities, *The Emerging Wonder of Asia* aimed to encourage a modal shift from road to rail by promoting railway. To this effect, the strategies to improve public transportation focussed on upgrading railway lines to double tracks, expanding the existing railway network to connect commercial ports and important places/regions in the country. Additionally, the existing traditional transportation systems in Sri Lanka – mainly buses and trains – need significant improvement. To address this

need, *The Emerging Wonder of Asia* development framework proposed TSM strategies such as Bus Rapid Transit (BRT), LRT and Mass Rapid Transit (MRT) to be introduced to Colombo and suburbs to expand the choice of transport modes.

Similarly, this framework envisioned constructing a MRT underground rail system in the city limits to connect other rail lines to all regions of the country. Additionally, the framework proposed multistoried parking for buses and private vehicles. This included the introduction of buses with greater seating capacities with internet facilities and a monorail transport system for Colombo and the suburbs as a high-speed transportation mode to complement existing public transport systems. Further, Table 4 below represents the planned outcomes and initiatives under the *Emerging Wonder of Asia* framework.

**Table 4: Planned Priorities and Activities under Emerging Wonder of Asia Development Framework**

Sector Priorities	Activities Planned
Infrastructure and services	■ Upgrade rail lines as double tracks ■ Construct a new rail link between Talaimannar and South India. ■ Construct MRT underground in city limits ■ Provide multistoried parking ■ Introduce buses with a greater seating capacity
Utilisation of existing resources	■ Introduce shuttle services between airports, bus stations and railway stations ■ Introduce better inland water and coastal water transportation system ■ Introduce air taxis which take off from a water base
Improve safety and security	■ Introduce Electronic Signalling and the Global Positioning System (GPS) ■ Introduce a surveillance camera system to public transport services
Infusion of capital in new developments	■ Introduce new developments in a more systematic way to increase the return on investment
Provide a choice of modes of transport	■ Introduce BRT ■ Introduce LRT ■ Introduce MRT to Colombo and suburbs ■ Connect LRT lines with the MRT network ■ Introduce a monorail transport system as a high-speed mode ■ Increase vehicle fleet ■ Provide rolling stocks for domestic light passenger transport ■ Display time tables of the arrivals and the departures of different modes of transportation using electronic display boards
Competitiveness among modes and providers	■ Improve the railway system to facilitate the transportation of goods / cargo
Continual development and modernisation	■ Introduce shopping complexes, hotels and other luxury facilities including wireless internet access to bus stands and railway stations ■ Introduce self-operated e-ticketing system ■ Develop the existing SMS-ticketing ■ Introduce wireless internet access facility into the mobile units
Sectorial integration	■ Integrate related areas to reduce the demand for travel ■ Integrate development activities of the transport sector into the national master plan

Source: Department of National Planning and Ministry of Finance and Planning (2010).



Using the tagline “*Unstoppable Sri Lanka*”, the major thrusts in urban transport were developing systematic transport facilities and reducing traffic congestion in the urban sector. The strategies to improve public transportation and TSM aimed at establishing a well-linked and efficient transportation system inclusive of roads and railway networks. These were geared towards improving transportation including enhancing public transport regarding fleet and quality; increasing private sector participation in the public transport sector; and initiating bus priority transport while improving and expanding the railroad network (Ministry of Finance & Planning, 2013).

Furthermore, initiatives to reduce traffic congestion and improve urban mobility included introducing high capacity buses and exclusive bus lanes prioritising Bus Rapid Transits (BRTs). In terms of developing urban bus transport infrastructure facilities, this framework identified the need for the following; introducing bus lanes, providing a real-time passenger information system for passengers to plan their trips, introducing a national database of public bus transportation, and introducing an integrated fare collection system at a national level.

4.2 The Western Region Megapolis Master Plan: 2015 – 2019

During the 2015-2019 political regime, the urban transport needs were strategised through the Western Region Megapolis Master Plan funded by the Japan International Cooperation Agency (JICA). Similar to the previous policy scenarios, this plan focussed mainly on improving public transportation and TSM.

As such, this development plan recognised the urgent need to combat future traffic congestion of developing urban Sri Lanka and concentrated on improving public transport by providing an efficient mass transportation system. The overall Western Region Megapolis Master Plan encompassed many proposed projects, including a Bus System, the Rapid Transit System (RTS), the Rail System, and the Road system. Although investment in new buses requires less capital, creating additional designated bus lanes would involve expanding road space, adding significantly to the cost (Transport Team and Megapolis Project Team, 2016; Ministry of Internal Transport, 2015). Hence, the Western Region Megapolis Master Plan aimed to update the current bus system instead of installing a new BRT.

In addition, by 2035, a total of 499,000 passengers per day are projected in the WP, with Passengers Per Hour Per Direction (PPHPD) demand ranging from 15,000 to 27,000 on various roads (Ministry of Megapolis and Western Development, 2016). Since BRT was considered to carry only a maximum passenger load of 13,000, investment to carry more people was considered more suitable (Transport Team and Megapolis Project Team, 2016).

Another major emphasis in the Western Region Megapolis Master Plan for improving public transportation and TSM was the creation of the RTS for the WP. To achieve this, the government decided to pursue a Light Rail as opposed to the Monorail due to cost concerns and because there is no particular reason to use the Monorail as opposed to the Light Rail except for the fact that it is “aesthetically more blissful” (Megapolis Transport Planning Team, 2016, p. 11; Ministry of Megapolis and Western Development, 2016). The total cost for the 75 km of RTS was estimated at USD 3.5 billion, an average of USD 46.67 million per km (Ministry of Megapolis and Western Development, 2016). The initial projections indicated the feasibility study for the first line of the Light Rail – the Green line. This line which was to be elevated and run in a 15 km loop connecting Fort, Kollupitya, Bambalapitiya, Borella, Union Place and Maradana, was estimated to be completed in a year. The projected timeframe to build the line was three years upon completion of the feasibility study. The Light Rail train was to be operational by 2020 (Ministry of Internal Transport, 2015).

By 2018, the Ministry of Megapolis and Western Development identified four LRT traces from two feasibility studies carried out by the international consultants. Moreover, authorities established two project management units to handle the LRT network. (Ministry of Megapolis and Western Development, 2018).

The Western Region LRT Projects consisting of lines namely; Red, Green and Blue were to be managed by the Western Region Transport Development Project (WRTDP) and the Purple Line to be handled by Colombo LRT Project. In July 2019, the first phase of the proposed Light Rail Project was launched with the assistance of JICA (Sri Lanka Railway Forum, 2019). The total investment for this LRT connecting Malabe and Fort estimated at USD 2.2 billion, was to be financed by JICA at USD 1.85 billion (The Island, 2019). Unlike the previous policy, in addition to improving public transportation and TSM,



the Western Region Megapolis Master Plan also emphasised TDM strategies such as regulating taxis, developing a small water transit system, improving traffic signals at intersections and creating pedestrian paths and bicycle paths.

On the policy end, the Western Region Megapolis Master Plan also encouraged businesses to offer flexible working hours and carried out road pricing for entry into the Colombo Business District (Ministry of Megapolis and Western Development, 2016).

4.3 Vistas of Prosperity and Splendour: 2019 Onwards

Vistas of Prosperity and Splendour is the latest available policy framework for urban transportation (Ministry of Finance, Sri Lanka, 2019). This policy framework aims to develop an efficient and environmentally friendly public transport system. The Vistas of Prosperity and Splendour framework underscores TDM strategies to improve public transport facilities, discourages the use of private vehicles, and introduces the 'park and ride' system. The policy framework also aims to establish a public transport framework, where SLTB and private bus operators co-exist (i.e. with a single transport e-ticket system common for both public and private transport services) and

Table 5: Transportation Strategies and Proposed Activities in Vistas of Prosperity and Splendour

Strategies	Proposed Activities
Development of a modern rapid transport system to ease congestion in transport and commuting	■ Develop a Metro Rail system to link the satellite cities in the Colombo district including the Port City ■ Develop a LRT system to ease congestion in transport and commuting ■ Introduce a Radial and Circular road system while adding sky bridges, vertical parking lots and flyovers in key areas
Development of road network and road transportation	■ Rehabilitate unfinished roads ■ Complete construction of unfinished expressways without further delay ■ Remove traffic bottlenecks by introducing overtaking lanes ■ Develop an alternative road system to facilitate higher level of access to main roads and expressways ■ Modernise the SLTB ■ Re-fleet the current bus stock and introduce environmentally friendly (Green Transport) buses to ply within the city limits of the New Colombo ■ Introduce a 'park and ride' system ■ Revise and revisit the current traffic fine system and establish a mechanism that would make private bus operators disciplined, strictly obey traffic rules and comply with other public safety standards
Development of Rail Transport	■ Develop bus routes linking rail services to ensure proper intermodal connectivity ■ Develop and upgrade existing rolling stock ■ Electrify Veyangoda-Colombo-Panadura, Ragama-Katunayaka-Negombo and Maradana-Homagama railway lines ■ Provide assistance to import locomotives and to build trailers locally

Source: Compiled by the authors based on National Policy Framework: Vistas of Prosperity and Splendour (2019).



work to a common timetable with profitability; a modern rapid transport system to reduce traffic congestion; and facilitate hassle-free commuting (this includes the development of a metro rail system, LRT system and a radial and circular road system),

Furthermore, the policy framework also focussed on TSM strategies to address Colombo's traffic congestion by introducing a radial and circular road system while adding sky bridges, vertical parking lots and flyovers in key areas, thus improving the overall infrastructure and maximising the available space in the Colombo city limits. Similarly, the framework also prioritised having an integrated road network that will be built based on the development plan ensuring the connection of all road networks to the respective economic corridors. This policy plan also emphasised creating a new Colombo commercial and financial hub with a new landmass added.¹ As such, developing a Metro Rail system (to link satellite cities in the Colombo district including the Port City) and a LRT system, thereby enabling a mixed choice of transport, are projected to ease congestion in transport and commuting. Table 5 below details the proposed activities in the policy framework of Vistas of Prosperity and Splendour, targetting transportation.

The transportation policy principles, goals and directives identified by the National Transport Policy Draft mainly focus on improving public transportation, TSM and land use planning. As such, it is guided by the policy principles of ensuring accessibility, affordability, sustainability and safety of transport systems and integration of land use into transport planning. In this context, the policy directives of the National Transport Policy Draft aim to improve the quality and reliability of public transport services, prioritise the use of public transport and expand the public transport network as well as increase the frequency of services with possible integration of different public transport systems, especially in urban environments.

The plan also focusses on better traffic and demand management mechanisms with the coordination of all stakeholders, integrating land use and transport planning to correct spatial imbalances so that demand for transport is minimised or trip lengths are reduced.

Other aims of the plan include maximising the private sector investments and public-private partnership (PPP) in TSM, enhancing research and development activities, and disseminating knowledge related to the transport sector.

4.4 Post 2019 Period – National Transport Policy Draft

Even though the National Transport Policy Draft was prepared in 2009, it was submitted for Cabinet approval in 2020. The Ministry of Transport and Civil Aviation (2018) asserted that the draft Policy gives directions for developing the transport sector in Sri Lanka.

Overall, it aims to provide necessary guidance to stakeholders in the transportation sector to improve transport systems to achieve strategic objectives and priorities of the government; in addition, the draft policy provides a platform to enhance the efficiency in long-term decision-making regarding infrastructure improvement, as well as guides on the necessary investment priorities to achieve the expected outcomes and service management in the transportation sector.

¹The framework envisions introducing legal and financial provisions to transform Colombo into an international commercial and financial hub.



5. Planning Context

While transport-related efforts during the last decade can be grouped into political regimes, projects during all three periods are broadly connected through the NPP, the only gazetted integrated planning document in Sri Lanka.

Two NPPs have been published during the decade; one in 2010 and the latest one in 2019. Specifically, for the period of 2011 to 2030, NPP has identified strategies that incorporate integrated land use and infrastructure framework to enable Sri Lanka to regain its development and foster growth with the end of the civil war. While NPP for the period 2017 to 2050 has given more attention to regulating and promoting urban areas with comprehensive development guidelines, the said plans will be varied out and implemented by the Urban Development Authority and other development agencies.

While the two physical plans have fundamental differences in terms of their planning framework due to the priorities of each period, when their strategies are taken as a whole, they cater to developing infrastructure and improving urban transport in Sri Lanka.

5.1 National Physical Planning Policy & Plan (NPPPP) 2011 – 2030

The NPP for 2011 – 2030 identifies three dominant objectives in developing transportation, as it is a vital aspect of economic infrastructure. The three proposed principles aimed to ensure access to domestic and international markets through connecting the country with the rest of the world and facilitating domestic transport of people and the exchange of products. The proposed plan also aimed to upgrade transport infrastructure to reduce the costs of commuting to jobs, economic activities and doing business. The three main strategies of the NPP 2011-2030 were to develop bus networks, upgrade and extend the railway network for passenger and freight travel, maintain and rehabilitate the existing road network and construct regional highways to urban regional centres. These three objectives included several strategies that broadly improve public transportation and TSM, as outlined in Table 6 below.

Table 6: Summarised Objectives and Strategies of NPPPP 2011 – 2030

Objective	Strategy
Develop bus networks to improve inter-city and intra-city connections	■ Extend and improve bus networks to connect urban centres ■ Integrate bus services with other forms of passenger transport (such as rail and aviation) ■ Develop a BRT system for Colombo
Upgrade and extend the railway network for passenger and freight travel	■ Improve track capacity and remove bottlenecks in the existing network ■ Improve passenger rail access between urban centres with a priority of connecting Metro Cities ■ Establish railway linkages from ports to inland container depots to facilitate transport and inter-modal transfer of containers ■ Establish a rail network around Colombo ■ Electrify rail links with Colombo's outer urban centres (Gampaha, Kalutara and Negombo) and the international airport at Katunayake
Maintain and rehabilitate the existing road network and construct regional highways to urban regional centres	■ Connect Metro Cities and economic gateways through the staged development of Access Restricted Highways and Expressways ■ Undertake a feasibility and planning implication study for the Palk Strait road connection to the Asian Highway route ■ Identify and improve local and regional walking and cycling networks

Source: Compiled by the authors based on the NPP 2011 – 2030 authored by the (National Physical Planning Department, 2010).

5.2 National Physical Planning Policy & the Plan 2017 – 2050

In 2017, the NPPPP was updated for the period covering 2017 to 2050. This new NPPPP provides an overall policy framework for planning physical developments in Sri Lanka and proposes the strategic national physical plan, developed by stakeholders, professionals and subject experts. The proposed action plan aligns with the National Transport Policy, which was approved by the Cabinet of Ministers in 2009.

The NPPPP 2017 – 2050 has identified many aspects of improving urban transportation in Sri Lanka, which broadly falls under the strategic thrusts of improving public transportation and TSM. For instance, NPPPP 2017 – 2050 plans on developing public transportation and making them affordable to the common populace, improving the infrastructure, and ensuring quality and reliable service as well as improving urban areas as a whole can be stated as some examples.

The report further notes that heavy investments in high tech transportation solutions for local passenger trans-

portation may not be economically viable going forward. This is because the residential populations within most of the metro regions and cities except the Colombo Metro Region, will not exceed a million.

Thus, the NPPP identifies that for the period up to 2030, in a majority of urban areas, local passenger transportation needs can be best served by improving the existing bus services, while private vehicle ownership can be minimised through promoting public transport (National Physical Planning Department, 2019).

Moreover, the NPPP notes that out of the available public transportation modes, rail transport proves to be the most economical for inter-regional goods and passenger transportation and urban mass transportation (National Physical Planning Department, 2019). Additionally, NPPP underscores the potential of linking all public transport modes to develop transport networking hubs, BRT, Park and Ride system, LRT to upgrade the transport system in Sri Lanka. Table 3 below summarises the major objective and the strategies of the NPPP 2017 to 2050.

Table 7. Summarised Objectives and Strategies of NPPP 2017 – 2050

Objective	Strategy
Optimisation of the available infrastructure	Optimisation of the utility of the already available transport infrastructure with minimum additions which will also release Sri Lanka from any additional debt burden for the next 30 years has been identified as the most viable option in the provision of transport infrastructure.
Investment in economically feasible projects	Investment decisions for transportation developments need to follow comprehensive feasibility studies before these are turned into projects.
Selection of environmentally sustainable modes	Minimising the use of private vehicles and the promotion of public transportation. However, from the available modes rail transportation will be prioritised.
Introduction of modern technology for efficiency and comfort	Automation of vehicles, electronic ticketing, and inter-modal integration will be deployed to ensure comfort and efficiency in both passenger and goods transportation.
Equality and equity in investments	Equal attention and consideration will be given to all; pedestrians, cyclists and motorists.

Source: Compiled by the authors based on the NPP 2017 – 2050 of the National Physical Planning Department (2019).



In addition to the aforementioned policy documents and master plans, it is noteworthy that Sri Lanka has also underpinned the National Road Master Plans (NRMP) by a sectoral policy to enable the road sector to respond to economic and social needs coherent with the country's macro-economic environment. The two latest NRMPs developed by the Road Development Authority are the NRMP 2007 – 2017 and the NRMP 2018 – 2027.

5.3 The National Road Master Plans (NRMP) 2007 – 2017 and 2018 – 2027

The NRMP which focusses on TSM, identifies investment priorities in the road sector over a 10-year period, paying particular attention to the availability of resources. It mainly concentrates on providing a physical plan for maintenance, rehabilitation, improving the existing network, new road construction, and setting up a spending requirement for national roads.

These two reports have identified the prioritised interventions to be focussed on for the national road network of trunk roads, main roads and expressways; these reports further present the integral nature of road development, with an emphasis on road safety and public transport facilitation. While doing so, these plans/policies adhere to environmental safeguards and cater to social obligations.

The key objectives of these two plans include; operation and maintenance of the national road network, widening and improvement of the national road, improvement of infrastructure to reduce traffic congestion and development of expressways (Road Development Authority, 2018).



6. Case Studies

As analysed above, despite a sound planning context and a nuanced but somewhat consistent policy context to address transportation issues in Sri Lanka, the progress made over the years is limited. Sri Lanka needs a strong impetus along many dimensions to break away from this stagnation in planning and policy orientation and move on to an implementation context. In identifying the critical areas that can guide and support Sri Lanka in its transition to a developed urban transportation system, three case studies were referred, namely, Metro Manila in the Philippines, Bangkok in Thailand and Hong Kong. These three cities have created mass transportation systems of their own and had their own share of positive and negative experiences in the process. As explained in the previous sections of the report, given the similarities of the traffic and public transportation concerns in these cities and the WP in Sri Lanka, learning from their efforts can effectively address the pressing issues related to urban transport. Lessons learnt will also be beneficial in tackling current transportation issues and mitigating future challenges.

6.1 Metro Manila

Manila is the capital city of the Philippines and Metro Manila refers to Manila proper and its outlying areas. Metro Manila comprises 16 cities and one municipality (Regmi, 2018), and is similar to Sri Lanka's WP in its efforts for decades to address traffic congestion. In 2018, Metro Manila reported a real per capita Gross Regional Domestic Product (GRDP) of USD 5,134. It remained the highest per capita GRDP in the Philippines (Philippines Statistics Authority, 2019), while the Metro Manila area was 636 sq. km with a population of 13.482 million (United Nations, 2019). Similar to Sri Lanka's WP, the economy of Metro Manila was the country's leading centre for commerce and finance (ILC, 2019).

During the 1970s, Metro Manila was in a situation similar to that of the current situation of the WP in Sri Lanka. The traffic congestion was significant; driving speed fell to an average of 5-12 km/h in some areas and the average traffic speed on many bridges fell to between 0-5km/h during peak times (JICA & NEDA, 2014). In addition, the

traffic congestion in Metro Manila was worsening with the growing population, expanding urban boundaries and an increasing number of private trips (Overseas Technical Cooperation Agency, Government of Japan, 2017). As such, the main issues faced by Metro Manila's transportation included a supply insufficient to meet growing demand amidst an adverse political environment with wandering political direction.

In order to remedy their traffic situation in the 1970s, the government considered a two-consultancy report by the Overseas Technical Cooperation Agency (OTCA) and the World Bank.² The OTCA developed a 15-year master plan that focussed on improving public transportation and TSM. This included improving the road system and upgrading some of the Philippine National Railroad (PNR), a five-line underground/elevated metro system, a proposal to use the current buses and jeepneys to supplement the transportation system, as well as offering a feeder service for the metro lines (Napalang & Regidor, 2015; Jose, Mabazza, Regidor, & Lagman, 2015).

The World Bank study emphasised revamping the existing bus and jeepney system, creating systemised routes and pricing, a dedicated bus and a LRT. The strategy presented by the second study was much cheaper, mainly because of the difference between the underground/elevated metro and the LRT. Due to cost concerns, the government of the Philippines followed the World Bank's recommendation but customised the same with some recommendations including those from the OTCA study. The government formed the Light Rail Transit Authority (LRTA) to oversee the project, and construction began in 1981 (Jose, Mabazza, Regidor, & Lagman, 2015, p. 7). The Light Rail officially opened in 1985 as the first mass transit system in South East Asia and the project cost USD 35 million /km (ADB, 2019, p. 11).

In certain respects, the project was a success; after its opening for many years, LRT1's operating finances were amongst the best in the world with full ridership (Halcrow Group Limited, 2004). However, this popularity soon became a two-edged sword, with the passenger demand for the Light Rail being higher than the capacity the cars

² The Overseas Technical Cooperation Agency (OTCA) is now known as JICA.



were designed to carry, and the trains were overcrowded, delayed, and not repaired (Jose, Mabazza, Regidor, & Lagman, 2015). In the 1990s, daily ridership of 301,000 to 330,000 per day had risen to 435,000 per day by 2017 (The Manila Times, 2015).

As such, though the individual project was a success, it failed in alleviating the traffic congestion in Metro Manila. As the population in Metro Manila grew, so did the traffic. In 1984, around 20,000 people passed per hour per direction down some of Manila's major traffic corridors. With the existing Light Rail already at capacity, there was no way for the transportation system to accommodate the increasing population (Halcrow Group Limited, 2004). Therefore, the government looked into creating two additional MRT lines.

Though the government began to plan for another transportation line in 1986, it did not finish the feasibility study for the new line (referred to as LRT2) until 1988 due to a change in political leadership (Jose, Mabazza, Regidor, & Lagman, 2015). Due to issues in funding, contracting, and legal delays, the commencement of the project lagged till 1996. Apart from this, the other issues such as changes in administration and routes, station locations, land issues and problems in planning the project resulted in the project dragging on till 2004 - almost 20 years after the original concept and 16 after the feasibility study (Jose, Mabazza, Regidor, & Lagman, 2015). In addition, LRT2 was the most expensive of the three lines costing USD 61.6 USD million/km (ADB, 2019).

LRT2 was created/developed as a heavy rail as opposed to a Light Rail, thus with a capacity to carry more people (1,628 passengers per train) than the LRT1 (1,358 passengers per train), partially explains the additional cost (ADB, 2019). However, the number of commuters on LRT2 was significantly less than those who used LRT1. In 2017, it was estimated that 240,000 people per day ride LRT2 as opposed to 435,000 people per day who ride LRT1 due to the line not being extended adequately to attract sufficient ridership (ADB, 2019; Jose, Mabazza, Regidor, & Lagman, 2015). Simultaneous to LRT2, a third line referred to as MRT3 was added but as a PPP with Metro Rail Transit Corporation (MRTC) under a Build Lease Transfer (BLT) contract. The MRTC was to build the Light Rail and maintain it for 25 years, while the government operated the MRT3 line and paid the MRTC an agreed-on amount of money (Halcrow Group Limited, 2004).

This arrangement ensured that the government bore all of the risk involved while the private company would get paid the same amount by the government regardless of the project's success. The project began in the 1990s and finished in 2000, significantly faster and cheaper (USD 39 million /km) than the LRT2 project (ADB, 2019). In 2004, the MRT3 carried 375,000 passengers per day, less than the estimated ridership of 450,000 (Halcrow Group Limited, 2004) (JICA, 2010). By 2015, the ridership grew to 560,000 and by 2017 deteriorated to 463,000 (with 20 operational trains) and later, the number of running trains was reduced to 15 to ensure passenger safety. In the subsequent years, the ridership of MRT3 has further fallen owing to a reduction in trains in operation, safety issues, poor maintenance, failing to undertake scheduled overhaul and upgrading work.

These issues/events resulted in an adverse effect of decreasing the revenue from ticket sales (Rappler, 2018). In terms of financing, for the first two projects - LRT1 and LRT2, the government was both the funder and the financier, whereas for MRT3, a private company financed the project while the government-funded the same with 100 per cent reimbursement. All the MRT lines were run by the government agency LRTA. In terms of construction, the MRT3 line was much cheaper than the LRT2 line, where the MRT3 line cost USD 40 million/km to build and estimated the LRT2 line cost as USD 57million/km (Halcrow Group Limited, 2004). In Metro Manila's case, the revenue generated made LRTA financially viable; therefore, the government subsidised the LRTA.

Despite the cost and efforts in TSM efforts, the development of metro lines has not alleviated the transportation and congestion issues in Metro Manila. Instead, the population growth has intensified the congestion. In 2014, although these three MRT lines have encouraged many people living in Metro Manila to use public transportation, where 69 per cent of all trips in Metro Manila used public transportation, private transportation continued to take up 78 per cent of road space (JICA & NEDA, 2014). To supplement transportation projects and encourage people to use public transportation, in 1995, the Unified Vehicular Volume Reduction Program (UVVRP) enacted banned cars with specific license plate numbers in certain areas throughout the day (Napalang & Regidor, 2015).

A limitation of this scheme was that the UVVRP also applied to vehicles used for public transportation, and it encouraged affluent people to buy two cars or motorcycles to circumvent the ban, resulting in more cars on roads in the long term (Regidor, 2013, p.68).

In the case of Manila's limited success in improving public transportation, there was no lack of expert inputs. Between 1970 and 2012, 12 different studies were conducted on Metro Manila's transportation and congestion, offering suggestions for potential solutions. Despite these recommendations, Metro Manila lacked a "definitive plan for an integrated and efficient transportation system" and projects were beset with delays and put on hold whenever there was a change in administration (Napalang & Regidor, 2015, p. 14). Regarding finances and project implementation, the privately constructed MRT3 finished four years ahead of the time taken by the LRT2 – the government-financed project and was significantly cheaper. In terms of design, LRT1 was limited in capacity to expand the line to accommodate more people, leading to overcrowding and inefficiency and inadequate length of lines which contributed to the inability to reach a significant number of potential riders.

6.1.1 Lessons from Manila

Lesson One: Metro Manila's example demonstrates that Sri Lanka should create a master plan and stick to it. One such approach is legalising the transportation plan that is developed. This would make it more difficult for a project to be postponed or disbanded when governments change. In addition, a unified government dedicated to improving the transportation system will help promote the WP transportation system. Another option is to garner support from the government, opposition and the public. If the public is behind the initiative, the government has greater incentive to complete it.

If this is not politically feasible, Sri Lanka can follow Metro Manila's example and develop a PPP. As discussed, when LRT2 was created in Metro Manila, it was put on hold whenever there was a change in administration resulting in many delays. However, the privately constructed project, MRT3 was not subject to those delays and finished four years before the government-financed project; this project was significantly cheaper. Manila has realised the effectiveness of PPP and the next MRT line, which recently had its groundbreaking ceremony, is also a PPP (Republic of the Philippines PPP Center,

2016). Sri Lanka could collaborate/work jointly with private companies to implement these projects, where the "unpredictable political influence and wandering political direction" would not be a significant risk factor (JICA, 2014, p. 70). However, the best-case scenario would be a strong government coordinating the implementation of the overall transportation plan. Simultaneously, private companies create individual projects. The government would oversee the overall system letting private companies work on the requirements of individual projects.

Lesson Two: Another positive lesson from Metro Manila is to move demand from private transportation to public transportation. Manila's method of reducing private transportation was to implement the UVVRP. Unfortunately, experts fault Metro Manila's UVVRP citing that people bypass the system by buying additional cars, hence to be successful, it needs to be partnered with an effective and efficient public transportation system (Tubadeza, 2015). Therefore, Sri Lanka shouldn't implement this same programme but a modified version with the kind of strategy that makes private transportation less desirable.

Lesson Three: One specific issue that Metro Manila encountered was its inability to expand the LRT1 line to accommodate more passengers; in turn, this scenario overcrowded cars that ran less efficiently, an important lesson for the WP, Sri Lanka. When Light Rail is built, it should incorporate modes to expand capacity if necessary. This may consider having trains run at smaller intervals, adding more cars to the lines, etc. If it could have operated trains frequently at peak times, this could also have been a giant step to increase efficiency without significantly increasing cost.

Lesson Four: The LRT2 train has significantly less ridership than estimated along those same lines. Partially, this is because it is not long enough to reach a significant number of potential riders. This is an important point for the WP to consider when developing its feasibility study. Authorities/governments should ensure that the lines are developed in such a way as to reach a sufficient amount of potential riders.

Lesson Five: The most crucial lesson Colombo and the WP can learn from Metro Manila is to consider transportation as a system instead of a collection of projects, create a plan, and ensure implementing the same.



6.2 Bangkok

Bangkok, like Manila, is in a similar position to Colombo in regards to its traffic levels and offers its own lessons for Colombo's traffic development. The city of Bangkok, the capital of Thailand is 1,569 sq. km in area with a population of 10.16 million in 2018 (United Nations, 2019). According to the latest available data, the metropolitan region around Bangkok is 7,761 sq. km (in 2013) with a population of 10.9 million in 2019 and a density of 1,410/km² in the same year (City Population, 2020).

Also, similar to Colombo, the GDP per capita in Bangkok metropolitan region is significantly higher than that of the rest of the country at THB 456, 911 (USD 14,301) (Suparak, 2015). Historically, Bangkok never developed an efficient road system and experienced a lack of urban planning as the country expanded. Hanaoka (2007) cited that existing roads were unable to effectively meet current traffic demand earning Bangkok a worldwide reputation for congestion in the 1990s. Furthermore, the World Bank estimated that vehicle speed during peak hours averaged 8km/hour; in 1995, 21 million trips were estimated within the Bangkok Metropolitan Region, while in 2013, the average peak speed of 20 kilometres per hour was reported on major roads in the central area (The World Bank, 2013).

As Bangkok developed economically, its traffic situation worsened. In the 1990s, public transportation accounted for 42 per cent of all trips. However, it was estimated that as Bangkok industrialised, the percentage of private transportation, particularly private car transportation would increase, putting a strain on the existing transportation infrastructure (The World Bank, 2013).

In the 1970s and 1980s, the Thai government's attempt to develop its public transport with a mass transportation system failed (Jittrapirom & Jaensirisak, 2016). The first line created was called the Green line or the Bangkok Mass Transit System (BTS) Skytrain. The Skytrain was developed as a full-scale metro spanning a network of 23.5km of elevated track and 23 stations (BTS Rail Mass Transit Growth Infrastructure Fund (BTSGIF), 2018). The project was conceived in 1990 and opened in 1999, taking only nine years to build, finishing one month ahead of schedule and costing USD 59 million /km (Suparak, 2015; Halcrow Group Limited, 2004).

The government partnered with a private company, the Bangkok Transit System Corporation (BTSC), to build the BTS Skytrain and negotiated a 30-year Build Operate Transfer (BOT) concession (Verougstraete & Enders, 2014). As a part of this concession, the BTSC was 100 per cent in charge of the construction, design, operation, financing and funding of the project (Halcrow Group Limited, 2004). For the 30 years that BTSC runs the operation, it retains the revenue from the tickets and rents, and does not receive any subsidy from the government (Verougstraete & Enders, 2014). Hence, it was feasible for BTSC to adjust the fares based on Consumer Price Index (CPI) and interest rate but was unable to set the fares for the train arbitrarily. As such, the government had no risk or cost associated with creating the BTS.

The BTS Skytrain was estimated to carry 600,000 passengers per day when it opened. During the first year, 1999, actual ridership was only 150,000 people per day (1/4 of the expected numbers) (Verougstraete & Enders, 2014). By 2006, ridership improved to 380,000 passengers per day and by 2013, the ridership had almost reached the initially forecast numbers. Factors contributed to the increase of BTS ridership since 1999, including two different line extensions that enabled the BTS to reach more people; the addition of escalators and the creation of an additional MRT line in 2004 made it easier for people to have access to the BTS. However, as the years of significantly lower ridership exerted a heavy financial strain on BTSC, it was unable to keep afloat and had to declare bankruptcy and pursue debt rehabilitation in 2004 (Verougstraete & Enders, 2014).

In addition to the debt restructuring, in 2013, the government paid USD 2.13 billion to purchase all of BTS's net farebox revenue until the end of the contract.³ In essence, the government transferred the business risk onto itself, and BTS was to get paid the same amount of money regardless of ridership (Verougstraete & Enders, 2014). These measures enabled the BTSC to continue operation and start making profits. Though this project was challenging for the private company, it was considered a success for the government who launched this MRT project with limited funding (Mass Rapid Transit Authority of Thailand, 2018).

³ Net farebox revenue = farebox revenue – operating costs and capital expenditure.

Next, the Blue Line project was a BOT type PPP with Bangkok Metro Company Limited (BMCL). The BMCL had the 100 per cent responsibility to finance, build and operate the train for the first 25 years, with the right to receive fares and the rents as revenue. BMCL was able to revise the fare every two years according to the consumer price index and the government-owned 80 per cent of the investment (Suparak, 2015). Therefore, BMCL shared a percentage of their revenue with the government in line with the agreement (Suparak, 2015).

The planning stages for the Blue Line began in 1996; construction began in 1998 which officially opened in 2004 (Suparak, 2015). Construction was delayed for the Blue Line for 13 months due to difficulties negotiating a concession, but generally, it was considered to have finished in an adequate timeframe (Halcrow Group Limited, 2004). This train was designed to be an underground metro and therefore cost significantly more than the BTS at a USD 155 million /km (Halcrow Group Limited, 2004). BMCL estimated the ridership for the Blue Line to be 430,000 a day during its first year (Otsu, 2008). However, opening numbers were significantly lower than estimates. For the first year, ridership was 147,489 per day and by 2013, it rose to 232,000 (Suparak, 2015). Once

again, the lower than expected ridership has had a detrimental effect on the private company running the Blue Line. By 2013, BMCL had an accumulated deficit of THB 12,700 million (USD 360 million), but unlike BTS, it did not receive support from the government for its operations (Suparak, 2015).

The other Mass Rapid Transit (MRT), the Purple Line, was a BOT with the private company BMCL. It was in charge of the construction, finance and maintenance of the line with the government authority, the Mass Rapid Transit Authority (MRTA), while also setting fares and collecting revenue and rents. MRTA was to pay BMCL a sum agreed upon for the construction and maintenance of the train (Suparak, 2015). The project was publicly funded for this contract, and the government faced the risk. However, the initial estimates for daily ridership were significantly lower at 120,000 for the first year before rising to 400,000 after a few years (Mahitthirook, 2016). This proves that learning from previous mistakes and working towards estimates being closer to actual ridership made the Purple Line more financially viable.

Table 8. Costs and Revenue of the Transit Lines in Bangkok

	BTS Sky train	Blue Line
Cost million USD/km	59 ¹	155 ¹
% Cost borne by the Government	0% ¹ Until 2013	80% ¹
Total expenses for operation	USD ³ 131.3 million 2015	USD 107.3 million USD ² 2013 (includes finance cost and income tax)
Total revenue:	USD 238.6 million USD ³ 2015	USD 82.5 million USD ² 2013
Net profit (loss)	USD 99.0 million USD ³ 2015 (including income tax expenses)	(USD 24.9 million USD) ² 2013

Notes:

1) Halcrow Group Limited, 2004;

2) BMCL, 2013

3) BTS Group, 2014

*Exchanged from the traditional currency by the authors and rounded off.



By 2016, the MRT lines did not seem to have significantly impacted Bangkok's overall traffic and congestion. Literature indicates that traffic in Bangkok slowed to 6-12km/h in the morning peak hours (Danaher & Kiatpongsan, 2013), partly because there has not been a significant change in the percentage of people that used public transportation in Bangkok. By 2029, it is estimated that 57.6 per cent of trips will be completed using private vehicles, and only 42.4 per cent will be completed using public transportation. This can be significant because it demonstrates no change in the percentage of people using public transportation in the 1990s. Moreover, if the population of Bangkok continues to grow, this will result in a net increase of people using private transportation (Mass Rapid Transit Authority of Thailand, 2014).

The number of people utilising the buses in Bangkok has dropped from an average of 4.1 million in 2008 to 1.0 million in 2011, a decrease of 6.8 per cent a year, and this decline is estimated to continue (Mass Rapid Transit Authority of Thailand, 2014). The preference to use private cars over buses was an issue that contributed to the lower ridership of MRTs, and causing more traffic congestion. To address this issue, MRT developed park and ride facilities (Suparak, 2015).

Part of the blame for the decline in public transport use and the rise of private vehicles was due to a strategic decision of the government that had unintended consequences. To offer a boost to the car industry affected by the 2011 floods, the central government offered a tax break to those who bought their first car (Lefevre, 2013). This tax break fostered a driving culture in Thailand that effectively undermined the development of the public transportation system. Instead of incentivising people to take public transport, this policy encouraged people to drive, resulting in more private vehicles and private trips.

The biggest success of Bangkok's transportation initiative is its usage of PPPs. Bangkok developed significant infrastructure projects through these contracts without the government providing full funding. In the case of the BTS Sky Train, it did not require providing any type of funding. In addition, the government didn't have to bear any risk associated with the operation of the Light Rail. However, a PPP should not be considered a silver bullet. On top of this, Bangkok has realised that when projects are developed on a piecemeal basis and with various contractors, such projects lack integration and turn out to be less efficient (Suparak, 2015). An example of lack

of integration is the new Purple Line stopping 1 kilometre away from the Blue Line, instead of stopping at the same station (Mahitthirook, 2016).

Another issue faced in Bangkok was the overestimation of the ridership, where BTS went bankrupt due to this reason. The main reason for Bangkok's low ridership for the BTS was the lack of integration with a mass transportation system. The poor bus system was not of much assistance for the population to move around the city using the Sky Train, while the absence of escalators etc., created accessibility issues. At the same time, insufficient length made the line unable to reach additional potential customers (Verougstraete & Enders, 2014). Moreover, in terms of ticketing, the Blue Line and the BTS both used smart card technology but not the same technology. At this level, an integrated system was lacking. Therefore, if a passenger wanted to transfer from one train to the other, they would need two different cards (ADB, 2009). In addition, the bus system doesn't use either smart card but only cash, which makes it cumbersome for a customer to have access to the whole city when using public transportation. Moreover, the buses were not modernised (not assigned their own lanes, so these were stuck in traffic as well, and not moving to smart card technology) to fit into the new transportation system; people were incentivised to drive, undermining the success of Bangkok's entire transport system.

6.2.1 Lessons from Bangkok

Bangkok has 20 years of experience working with its transportation system and offers many lessons for the WP.

Lesson One: The biggest success of Bangkok's transportation initiative thus far is its usage of PPPs. Through these contracts, Bangkok developed significant infrastructure projects without total funding by the government. In the case of the BTS Sky Train, it did not require any funding. In addition, the government doesn't face any risk associated with the operation of the Light Rail. Though a private company providing 100 per cent of the funding and taking all of the risk for a project may be extreme, it demonstrates that with the right contract, the WP can look for a private company to finance and potentially fund part of a project.

Additionally, the WP should take advantage of the private sector, as requiring USD 11.477 billion to invest on



its megapolis transportation system considering synergies/opportunities of the private sector is worthwhile. However, a PPP should not be considered a “silver bullet” for the WP. Bangkok experience showed that projects developed on a piecemeal basis lack integration and become less efficient (Suparak, 2015), resulting in the new Purple Line stopping 1 kilometre away from the Blue line in a different station (Mahitthirook, 2016). If Sri Lanka is to go ahead and work together with PPPs, then an integrated approach is to be ensured for success of the project.

Lesson Two: Another distinct lesson from Bangkok is the overestimation of the ridership, as for the BTS, severe issues in ridership caused the company to go into bankruptcy. Therefore, the WP should be highly aware/attentive of overestimating its ridership. It would benefit the WP to analyse cities with similar populations/demographics and their initial ridership and estimate ridership accordingly; the consequences of overestimation could be severe.

Further to the above, the reasons behind Bangkok’s less than expected ridership must also be examined thoroughly. Experts estimate that the low ridership for the BTS was caused primarily due to a lack of integration with a mass transportation system. The poor bus system in Bangkok made the Sky Train less accessible. In addition, the Sky Train was difficult to access, lacked escalators, and wasn’t suitable to meet the needs of additional potential customers (Verougstraete, 2014, P.3). The lack of integration in Bangkok’s system can be seen in many different ways; payment is one of the most striking. The various technologies used in the Blue Line smart cards and the BTS necessitated passengers to use two different cards when transferring from one train to the other (ADB, 2009).

In addition, the bus system doesn’t use either smart card but only cash, making it even more difficult for a customer to have access to the whole city using public transportation. It is important for the WP to ensure that the individual projects built at different times possibly with PPPs would become part of an integrated system. Although the bus system was an important aspect for Bangkok, it was the weakest part of Bangkok’s transportation system. Because of the lack of integration with the metro lines and the fact that the buses weren’t modernised to fit into the new transportation system (not allotted their own lanes so they were stuck in traffic as

well, and not moving to smart card technology) people were incentivised to drive, undermining the success of Bangkok’s entire new transport system.

Since the government has decided to forgo a BRT for the WP and instead intends to revamp its current bus system, this can be a possible pitfall for them as well. If the MRT projects are developed but the bus system cannot support them, the latter will flounder, lose money and not improve the traffic congestion in the WP.

Even if a new BRT system is not created for Colombo, it is recommended that authorities put considerable time and energy into revamping their current system and not become complacent. As Bangkok has demonstrated, a mass transportation system is more than a collection of projects and if the system is not integrated, it will then be inoperative.

Lesson Three: Another important lesson that relates to Bangkok’s policy on private vehicles is that, in contrast to Metro Manila, Bangkok’s policies and laws encouraged private transportation instead of promoting public transportation. It is not that Bangkok purposefully undermined its public transportation projects but the country fell prey to weaknesses of its new policies. This lesson can guide Sri Lanka to not promote private transportation in its policies, laws, or tax breaks.

6.3 Hong Kong

Hong Kong’s transportation system is considered the gold standard and regarded as one of the top transportation systems in the world (The World Bank, 2017). Hong Kong is made up of many small islands, the three largest being the island of Hong Kong, Kowloon, and the New Territories.

In 2019, the population in Hong Kong was approximately 7.52 million and the per capita GDP was USD 48,755 (The World Bank, 2019). The area in the city was 1,106.66 km² resulting in a high population density of 6,880 people per km² of usable land (Government of Hong Kong, 2020). This high density has forced Hong Kong to develop a robust and efficient transportation system not based on roads. As a city-state, Hong Kong does not require its transportation system to expand outwards from the city limits.

In the 1960s, with a growing population of 3.1 million, Hong Kong recognised the importance of transporta-



tion and began to 'plan systematically for the territory's future transport needs' (Transport Department, Government of Hong Kong, 2008; Yiu, 2001; Department of Statistics, University of Hong Kong, 1974). As a part of this plan, in the 1970s, Hong Kong conducted a 'Comprehensive Transport Study', which was completed in 1976 by the Transport Department. This study recommended creating a public transportation system and advocated better use of road space (Transport and Housing Bureau, 2017). Since then, there have been two more comprehensive studies referred to as the "Comprehensive Transport Study Two" and "Comprehensive Transport Study Three" completed in 1989 and 1999, respectively (Government of Hong Kong Special Administration Region, 2019).

This line was called the "initial system" or the Kwun Tong Line. Construction began in 1975 and was completed in 1980 (Transport Department, Government of Hong Kong, 2008). While the Kwun Tong Line was still under construction, the government approved construction for Tsuen Wan Extension Line in 1977. Construction for the second line began in 1978 and was completed in 1982 (The Government of Hong Kong, 2020; The Government of Hong Kong, 2015).

Construction for the third line was announced in 1980, began in 1981 and was completed in 1985 (Transport Department, Government of Hong Kong, 2008). The government has continued with this fast-paced development of its MTR Lines. By 2020, Hong Kong boasts 10 different heavy rail lines and one Light Rail line with over 200km track and it is still expanding its reach (Trans-

Table 9: Costs and Revenue of the MRT Line

	MRT
Cost million USD/km	131 ¹
% Cost borne by the Government	0% ¹
Expenses	USD3.3 Billion USD ² 2015
Revenue	USD5.38 billion USD ² 2015
Net profit: (includes ridership revenue, rental income,)	USD1.69 billion USD ² 2015

Notes:

1) Halcrow Group Limited, 2004

2) MTR, 2015

*Exchanged from Traditional Currency by author, then rounded off.

Each study was then followed by a green paper, which gives the public an opportunity to analyse suggestions and offer comments. Hong Kong has created updated studies to adapt the original plan to their changing situation, for example, having a stronger concern with the environment and "green technology." However, all of the studies continue the same basic strategy which can be divided into three areas: to develop an efficient public transportation system with heavy rail as the backbone, to foster competition between different transportation companies to improve services, and to deter the public from using private transportation in favour of public transportation.

Even before 1976, Hong Kong was working on "Comprehensive Transport Study" developing their heavy rail system. In 1973, the government announced the construction of the first line of their Mass Transit Railway (MTR).

port and Housing Bureau, Government of Hong Kong, 2020). Furthermore, Hong Kong's Railway Development Strategy framework planning future expansion of railway network up to year 2031 indicates five projects which were underway at that time (in 2014); it was expected to extend the railway's reach by 25 per cent at the time of completion (Transport and Housing Bureau, 2014; MTR Corporation Limited, 2014). By 2004, the average cost for Hong Kong's lines was USD 131 million /km (Halcrow Group Limited, 2004).

Along with the development of MTR and the Light Rail, Hong Kong electrified the Kowloon Canton Railway (KCR) in 1980 to provide commuters with an efficient way to travel between the centre of Hong Kong and the Kowloon Island (Tang & Lo, 2010). In 2007, the KCR merged with the Mass Transit Railway Corporation (MTRC); hence, currently, there is only one MTR



operator in Hong Kong (Loo, Chen, & Chan, 2010). The government of Hong Kong developed the MTRC to build, finance and operate the MTR (MTR Corporation Limited, 2019). Unlike most mass transportation systems, MTR is privately run and funded with no direct subsidies from the government, while its stocks have been traded on the Hong Kong Stock Exchange since 2000 (The World Bank, 2017). The case of MTR is unusual because, contrary to conventional wisdom for public transportation systems, MTRC, without government support/funding, is financially successful. Part of the financial success of the MTR is because of the ridership, and the first line, which opened in 1979, saw a profit by 1982 (Institute of Civil Engineers, 1990). According to estimates in 2008, MTR had an annual ridership of 867 million (Loo, Chen, & Chan, 2010). In 2018, MTR reported 2.044 billion passenger journeys and was considered the best-run metro in the world with a 99.9 per cent on-time passenger service rate (MTR Corporation Limited, 2019).

Though MTR has impressive ridership that collects significant revenue and is run efficiently, it has been projected that if MTR relied on the revenue from fares alone, it would not be financially sustainable. As such, MTR has made a concerted effort to develop commercial activities at its railway stations. The government has allowed MTRC to have exclusive rights to develop the property on top of its railway stations (Loo, Chen, & Chan, 2010). This activity has been successful and MTRC has almost doubled its non-fare recurring railway operating revenue between 2000 and 2009 (Loo, Chen, & Chan, 2010). In addition to allowing the MTRC to remain financially stable, this non-fare revenue has also allowed MTRC to keep its ticket prices much lower than other similar metro stations globally.

One of the major components of Hong Kong's transportation strategy is to offer opportunities for private transportation companies and then foster competition between the companies to promote better service. In addition to the MTR lines, five different franchised bus companies also provide transportation around Hong Kong (Lo, Tang, & Wang, 2008). Two of the largest bus franchises are the Kowloon Motor Bus and the Citybus. Before the 1990s, the government was keen to promote the railway system, limiting the bus routes to avoid overlapping with the MRT lines. However, in 1994, the government abolished these regulations to foster competition between the various bus lines and improve the quality of the bus services (Tang & Lo, 2010) which was

successful in many ways. The bus network became more comprehensive, frequent and convenient, and offered air conditioning and built shelters at different bus stops (Tang & Lo, 2010). However, these developments led to a 60 per cent increase in the number of buses on the road between the years 1994 and 2004, leading to a rise in traffic and an oversupply of buses relative to the demand for their transportation services (Tang & Lo, 2008).

At the same time, the buses became more popular than the MRT due to their door-to-door service, making it tough for the latter to remain financially viable. Understanding these issues, the government aimed to limit the supply of buses to maintain MTR as the backbone for the transportation system. However, by then, commuters were used to the buses and it became politically difficult to limit the bus routes again (Tang & Lo, 2008). Nevertheless, different governments in power have been successful in some aspects. For instance, in 2013, 15 overlapping bus services were consolidated. Here, the excess services were cancelled and the frequencies of about 100 bus routes were reduced. It is estimated that since 2004, the number of franchised buses in Hong Kong has slightly decreased from 6,000 to 5,800 (Transport Advisory Committee, 2014).

One of the key aspects of Hong Kong's transportation plan was shifting people from private transportation to public transportation. This was achieved by limiting the number of people who own a private vehicle by a) enactment of a first registration tax (FRT), which causes people who are buying a car to pay an additional fee; and b) increase in annual vehicle license fee (Hau, 1997). These two initiatives have been quite successful. Since 1997, Hong Kong has consistently had around a 90 per cent rate of public transportation used daily, which is the highest in the world (Transport and Housing Bureau, 2017). In addition, in 2018, there were 565,213 private licensed cars in Hong Kong (Transport Department, 2019). Considering that Hong Kong has an adult population (15+ years old) of around 6.62 million in 2019, the low share of 8.5 per cent adult population owning a car is impressive (Census and Statistics Department, 2020).

Hong Kong intervened early enough with its traffic initiative, and even though it is one of the densest cities, it does not struggle with traffic congestion. This can be best seen in the various speeds of Hong Kong's traffic. In the 1980s, the average speed for peak hours in main roadways was 30 km/hour (Hau, 1997). In 1999, the traf-



fic speed was reduced to 20 km/hour and the government intervened until it was above 20km/hour to what was deemed a more acceptable level (Tang & Lo, 2008). Between 2003 and 2013, the traffic speed on main roads in Hong Kong Island, Kowloon and New Territories averaged 20.99, 25.05 and 41.55 km/hour, respectively (Transport Advisory Committee, 2014).

During peak times in Hong Kong Island, the decrease in speed in some areas as low as 10km/hour, is higher than the average traffic speeds in Manila or Bangkok.

More recently, in response to traffic congestions during peak times, Hong Kong attempted a congestion pricing system for vehicles entering specific zones. Under the scheme, a different fee would apply for entering the zone at various times, with the higher fee during peak times. The scheme would rely on an intelligent transport system to identify vehicles entering the zone using automatic vehicle identification systems and radio frequency identification. This device installed in vehicles would charge vehicles entering the zone (The Standard, 2019). Nevertheless, the proposal never took off in the absence of support - both from the public and the administration (Brownlee, 2019). Some criticisms levelled against the proposal include, "The scheme was unfair to ordinary drivers. Rich people may drive their cars into the area as they won't mind paying, so it might become a specialised zone for the rich." (The Standard, 2019).

Hong Kong's transportation initiative is as close to a success story that exists today. The government of Hong Kong recognised early the potential danger heading towards their transportation system, hence developed a comprehensive strategy to prevent this situation and enacted the strategy with success. As a result, they mitigated a significant portion of private transportation in favour of public transportation, which kept traffic congestion low at minimal cost to the government itself. In this instance, Hong Kong successfully coordinated the transportation strategy without being the one to enact it. This strategy was only successful because the government entitled MTR the right to build on the land and receive the rent from shops. Moreover, Hong Kong complemented these with appropriate policies to successfully deter people from driving their private cars, such as combining the 'First Registration Tax' and the 'Annual License Fee'.

For years, 90 per cent of Hong Kong's trips have been associated with public transportation despite its high

GDP per capita. The only time Hong Kong's actions were less than "successful," is in terms of striking a balance between working with and regulating the private sector. When Hong Kong deregulated the bus system, the generated competition dramatically improved the bus system, making buses come more often and facilitating better services. However, it also resulted in the supply of buses exceeding the demand. It increased the traffic on the road, hence the MTR, the supposed backbone of the transportation system lost ridership. This explained that the government couldn't only rely on the private sector to provide transportation; rather, it must coordinate existing services to regulate supply and demand so that the transportation system remains financially stable in the long run (Tang & Lo, 2010).

6.3.1 Lessons from Hong Kong

Hong Kong's transportation initiative is as close to a success story that exists today. The government of Hong Kong identified the potential danger in their transportation system promptly and developed and enacted a comprehensive strategy with success. As a result, they mitigated a significant portion of private transportation in favour of public transportation, which kept traffic congestion low at a minimal cost to the government itself. In this instance, Hong Kong successfully coordinated the transportation strategy without being the one to enact it. These are important take-home lessons for the WP as these can help create a plan and successfully implement the same.

Lesson One: Looking more specifically, a few particular lessons from Hong Kong would benefit the WP as it develops its own transportation initiative. One of the most significant lessons is about financing the MTR. Hong Kong is one of the few success stories of how a private company successfully runs a mass transit system and profits by investing in its train stations and developing rental space. This success was mainly hinged upon MTR's capacity to develop the land and receive the rental income and the conducive environment in Hong Kong to do so. This scenario is in contrast to the WP.

On the other hand, WP includes a small, highly dense urban area, a proportionally large population with high GDP, a low private transportation rate, and one of the best-run metro trains in the world. Therefore, the WP will probably end up supporting the Light Rail with a subsidy. However, it can significantly lessen the subsidy by



placing shops and businesses in train stations and using the rent to support the Light Rail. The Master Plan has not mentioned placing shops in the new transport multi-modal hubs. Hence, this would be a simple adjustment and could extensively support the Light Rail and the transportation initiative as a whole.

Lesson Two: Another successful initiative from Hong Kong that offers a positive example for Sri Lanka is how Hong Kong has successfully deterred people from driving their own cars. The combined impact of Hong Kong's availability of affordable and well run public transportation and the fiscal measure, namely the First Registration Tax and Annual License Fee, have been crucial in reducing the use of private vehicles. As a result, despite Hong Kong's high per capita GDP, for years, a large majority (90 per cent) of its trips have been made using public transportation.

This can delay some fatalism that citizens will automatically buy a private vehicle once they have enough wealth. Hong Kong's limited land area makes owning a car unnecessary. In contrast, Sri Lanka is relatively much bigger and it may be convenient for people to have their own car to travel long distances to other areas of the island. Therefore, this particular method of reducing private transportation might not be the best fit for Sri Lanka. Still, Sri Lanka should consider alternative methods of reducing private transport to benefit its public transportation system.

Lesson Three: Hong Kong's practise of developing a green paper and accepting public comments along with the development of any new comprehensive transportation study, has promoted transparency by ensuring the public awareness and engagement. Such a green paper which fosters public dialogue which would benefit the WP. A green paper would inform the public of the government's actions and help garner public support for the initiative. This is particularly important in Sri Lanka, considering the BRT and the LRT debate. A green paper would enable a public discussion and ensure that people access accurate and reliable information.

Lesson Four: The last lesson from Hong Kong concerns the rare occasion when its actions were short of "successful," in balancing working with and regulating the private sector. When Hong Kong deregulated the bus system, it generated competition that dramatically improved the bus system, making buses come frequently

and providing better services. However, it also resulted in the supply of buses exceeding the demand. It increased traffic on the road, so the MTR, the supposed backbone of the transportation system lost ridership. The government cannot only rely on the private sector to provide transportation; it must coordinate the existing services to regulate supply and demand so that the transportation system remains financially stable in the long run (Tang, & Lo, 2010, P.310).



7. Conclusions and Recommendations for Sri Lanka

Much attention has been paid to improving public transportation in Sri Lanka during the last decade. Consequently, many plans and policy frameworks were developed, and some projects were initiated. Nevertheless, many of these initiatives and projects have been carried out amidst existing challenges.

This study examined three case studies – namely Metro Manila, Bangkok and Hong Kong, where mass transportation was developed and successful. In doing so, there is much to learn from both the positive and negative experiences of their journeys. The extensive analysis of these three case studies provide overall lessons for Sri Lanka's future and ongoing efforts in terms of developing public transportation as follows;

1. Adopting a piecemeal approach instead of a holistic and systemic approach can leave individual transportation projects as successful. Yet, there is also a concern of such piecemeal projects not eliminating traffic congestion.
2. Developing a comprehensive master plan and adhering to the same without merely revising the project plan at every change in political administrations is important when carrying out transport development initiatives.
3. To attract commuters from private vehicles to take public transportation, the latter needs to be effective and efficient enough to cater to the quantity and quality demanded by commuters.
4. The design of transportation initiatives should enable transport lines to expand when needed to accommodate more people without overcrowding.
5. To achieve estimated ridership, transportation initiatives should be designed to make lines longer if required to reach potential riders.
6. Ridership estimates need to be realistic. Overestimation of the ridership can make transport companies financially unviable.
7. To avoid common reasons for low ridership, including lack of integration with a mass transportation system such as the absence of an integrated payment system across different components of public transportation, such as the use of different smart cards and technologies for ticketing, varying level of comfort and facilities across buses and metro lines, difficulty in access (lacking escalators), and lines not long enough to meet the needs of additional potential customers.

8. Transport sector policies and other related policies i.e. on car manufacturing etc., need to consider their impact on efforts to discourage the use and ownership of private vehicles, and promote public transportation.
9. Policies to deter people from driving their own cars need to be complemented with a cheap and well-run public transportation system.
10. Adequate attention needs to be paid about how people would circumvent policies and regulations introduced to attract demand from private to public transportation.
11. Government funding is one of many alternative ways of funding transportation projects.
12. Privately constructed transportation projects can be cheaper and efficient.
13. PPPs offer the opportunity to develop infrastructure projects without the need for government support, having to provide all of the funding, and bearing all the risk.
14. PPPs should involve the right to build on the land and receive rents from shops, in addition to fare revenue.
15. Strike a balance between working with and regulating the private sector.
16. Foster public involvement in transportation initiatives and provide the opportunity for the public to read and comment on government plans.

Recommendations are based on these lessons learnt from Manila, Bangkok and Hong Kong to address some already experienced and potential issues in Sri Lanka.

- 1. Create an overall single master plan combining the piecemeal approach across activities and legalising the document to ensure its existence and continuance regardless of a change in administrations.**

A main challenge faced by public transport initiatives in Sri Lanka is the changes during the implementation due to changes in political administration. For instance, since 2010, the NPPs were a binding thread that pulled varied policy directions into a single plan across all three regimes. All regimes exhibited interest to develop a rail system to improve public transportation and traffic congestion in Colombo. Nevertheless, after the lapse of a decade, still, the plans and the project remain at an in-



ipient stage. For instance, it was only by the end of the year 2018 that the approval was received from the Central Environment Authority for a LRT system. Accordingly, a draft act was formulated and submitted to the Department of Attorney General to regulate such systems. Subsequently, JICA provided financial assistance under the economic corporation loan with special conditions (Ministry of Megapolis and Western Development, 2018).

Nevertheless, by June 2020 - having signed a USD 270 million loan tranche with JICA, preliminary work commenced, and USD 130 million contracts had been signed with a project consultancy firm, the project was changed again (Economy Next, 2020).

Critics attribute such delays and changes to uncertainty in plans and political will, adverse political interventions, and unclear separation of responsibilities and coordination leading to “unpredictable political influence and wandering political direction”, which negatively affect transport initiatives in Sri Lanka (Japan International Cooperation Agency Oriental Consultants Co. Ltd, 2014, p. 70).

Exemplifying issues such as lack of planning, the feasibility study of the LRT system project was delayed in 2015, as the length of the railway line was extended from the initial plan of 52 km to 84km (Ministry of Megapolis and Western Development, 2018).

Yet another adhoc change was done midway to extend the planned 16 km LRT line from Malabe to Fort by another 8 km (Economy Next, 2020). However, when considering the case of Manila, their experience suggests that if a master plan is proposed, the respective enablers of the plan should stick to it by legalising the document to ensure its existence regardless of the administration. These circumstances would be challenging for a project to be postponed or disbanded in case of a change in government.

Similarly, since laws can be bypassed, it is important to gather support from the government, the opposition and the public to stay on course. If the public is behind the initiative, it will encourage the government to complete it. Furthermore, updates and revisions to plans based on the latest information are beneficial to achieve the proposed development outcomes.

Specifically, the lessons from case studies highlight the importance of flexibility in designing public transportation initiatives to enable transport lines to expand and lengthen when needed. Nevertheless, such updates and revisions to plans are beneficial if formulated for legitimate reasons, outside rent seeking motives.

At the same time, such alterations are advantageous as long as these align in the context of the overall plan and the aim to develop a public transportation system, hence not overly focussing on individual projects. If changes are adapted to existing plans in such a holistic and altruistic manner, these would ensure that Sri Lanka can avoid debacles, such as the case of Bangkok’s Purple Line and Blue Line stopping 1 kilometre apart instead of reaching the same station stop.

As such, learning from the experiences observed in the case studies, Sri Lanka should create a master where plans concerning public transportation are viewed as a comprehensive system instead of a collection of individual projects and follow such as plan for successful implementation and operation.

As seen in the case studies, a practical strategy to achieve this is by legalising the transportation plan to ensure its existence regardless of the administration; this would also become more binding than the NPP. Such a manoeuvre would minimise possibilities for a project to be postponed, disbanded, or arbitrarily revised along with a change in government. Nonetheless, there are times when laws too are sidestepped. As such, it is important to garner support from the government, the opposition, as well as the public.

2. Enhance public awareness on transport plans and projects.

If the public support is behind the initiative, the government has more incentive to complete the same. In the case of many transport initiatives in Sri Lanka, there has been limited public awareness and approval. For instance, critics argue that similar projects in Sri Lanka have limited public awareness and inadequate professional evaluation, resulting in projects being “actioned” before their systematic planning is completed (Daily FT, 2016). As such, learning from the example from Hong Kong, where a green paper would inform the public of the government’s actions, Sri Lanka should strive to emulate the same for two purposes.



On the one hand, such public involvement would obtain direct public views, support, and commitment and keep the public well informed with accurate information about planned projects, without room for speculation.

On the other hand, such public involvement could obtain indirect leverage of the public to push the government in power to deliver the planned public transport developments as well as follow due diligence regarding professional evaluations and appropriate planning. This type of public involvement would have been suitable for considerations in Sri Lanka's context when a shift in policy focus occurred from a BRT to an LRT to an elevated LRT network.

3. Take advantage of the private sector and work on an optimal PPP to invest for transportation projects, while the government retains the coordination and implementation role to ensure a systemic public transport development instead of piecemeal projects.

In addition to the public, another critical stakeholder in public transport development initiatives is the private sector. The involvement of the private sector would address one of the most significant challenges in transport sector development in Sri Lanka, which is financing. For instance, Bangkok's experience shows that their success is hinged upon PPPs. Bangkok developed significant infrastructure projects without the government providing total funding through these contracts.

However, when projects are developed on a piecemeal basis and with different contractors, the probability of lacking integration and being less efficient is generally high. Among alternative financing methods, such as foreign funding, local funding, funding through Sri Lanka's consolidated fund, and private investment, international experience shows that PPPs have a strong potential in public transport initiatives if adequately formulated.

Recent experience in Sri Lanka showed an instance of financing arrangement shifting from a government centred foreign loan to a PPP. Specifically, based on the traffic projections, it would be difficult to run the LRT project as a purely commercial venture, a soft loan was secured from Japan with a 12-year grace period, 40-year pay-back, and yen interest rate of 0.1 per cent for a LRT project. By 2020, this decision was reversed to seek proposals from private investors under a PPP arrangement.

As such, now "private firms will also have to get near commercial rates of interest which tend to sharply push up costs, compared to a Japanese soft loan with a long grace period", (Economy Next, 2020). At the time of writing, it remains unclear why the soft loan was rejected in favour of a PPP. In pursuing PPPs, the Sri Lankan government needs to fully assess the potential risk and financial burden that would otherwise fall back on the government.

Experience from the Manila case showed how the Philippines government was saddled with the burden of subsidising LRTA, while in Bangkok, the Thai government had to purchase all of BTS's net farebox revenue until the end of the contract and pay a fixed amount to BTS regardless of ridership.

These examples indicate that despite having PPPs, the relevant governments had to internalise business risk. If this latest attempt of PPP for the LRT in Colombo is materialised, learning from Hong Kong's international experience, it would be important for the government of Sri Lanka to provide revenue earning mechanisms beyond the fare box for the private sector operators. Such additional revenue earning mechanisms would ensure an excellent public transportation service, with affordable fares for commuters.

A recommendation in this connection is to provide exclusive rights to the private firm operating the LRT to develop the property on top of its railway stations and facilitate them to become financially stable and profitable. As such, to reiterate, changes and updates to plans are beneficial, as long as these are consistent with the overall plan and are not driven by vested interest and rent seeking behaviour.

However, the government cannot only rely on the private sector to provide public transportation but must retain a coordinating role and regulate supply and demand so that the transportation system remains financially stable in the long run (Tang, & Lo, 2010). As such, the experience in the case studies shows that the best-case scenario would be a strong government coordinating the implementation of the overall transportation plan while private companies create individual projects.

Here, the task of the government would be to develop the blueprint for the overall system facilitating the private companies focus on the details of the individual proj-



ects. In this backdrop, Sri Lanka can ideally capitalise on the private sector and arrive at an optimal PPP. Such a strategy allows the private sector to invest and confirm that the government maintains coordinating and implementing responsibilities to ensure a systemic public transport system development.

4. Make updated projections about ridership and revise same periodically with the latest information.

The analysis of the case studies has shown that regardless of the financing mechanism, unrealistic ridership estimates would jeopardise the financial sustainability of the transport services. In the case of Sri Lanka, the numbers pertaining to the Colombo Suburban Railway Project were criticised for being highly optimistic but not validated, since the estimates have been based on the projections of a study done several years ago when the growth of demand for the railroad had been high; since then, the demand growth for railroad has been much lower (Daily Mirror, 2017).

As such, Sri Lanka needs updated projections about ridership and revise the same periodically with the latest information. Similarly, addressing common factors that contribute to lower ridership, such as the use of different smart cards and technologies for ticketing across all modes of public transportation, accessibility issues, and lines not reaching further enough to meet the needs of additional potential customers, and varying level of comfort and facilities across modes of public transportation are vital.

Here, it is important to consider the current high involvement of the individual level private sector bus operators in Sri Lanka. Hence, Sri Lanka's plans to divert from private vehicles to public transportation should cover such private operators to provide a seamless and integrated public transportation service to commuters, with comparable comfort, service and integrated payment methods. Similarly, when Sri Lanka builds the LRT line, it should ensure that ways to increase capacity if necessary are to be incorporated into the project at the designing stage.

For example, to address the issue of trains being run at smaller intervals, there should be a possibility to add more cars to the lines. Similarly, to allow future expansions, lines should be developed in such a way as to reach a sufficient number of potential riders and evolve

with the changes in other modes of public transportation. As such, the design of each project should factor in considerations about integrating with other projects as well as modes and variations of transportation and diverting attraction from private vehicles towards public transportation.

5. Improve bus transport system to support LRT.

Finally, in tandem with the effort to develop a LRT, Sri Lanka should also focus on improving the bus transportation system, specifically to feed riders to the LRT. While the LRT is fixed in its reach, it would be the buses that cater to the last mile of commuters. If the bus transportation system is unable to support the LRT system, the latter would become a struggle and become unprofitable, losing its capacity to improve the traffic congestion in the urban areas. A precondition for diverting users of private vehicles towards public transportation is well functioning, efficient and comfortable public transportation system.

When the public transportation system is lagging behind in offering an alternative to using private vehicles, all attempts to attract private vehicle users to public transportation are bound to fail. Developing public transportation requires funds, effort, time and careful planning. As such, public transport initiatives should get a head start and develop services before restricting or discouraging private ownership and private modes of transportation. Learning from the experiences of the three case studies analysed in the study, Sri Lanka can avoid making the same mistakes and strive to move faster in developing an efficient public transportation system.



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