Providing Seamless Transport System

Strategy Paper

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I. INTRODUCTION

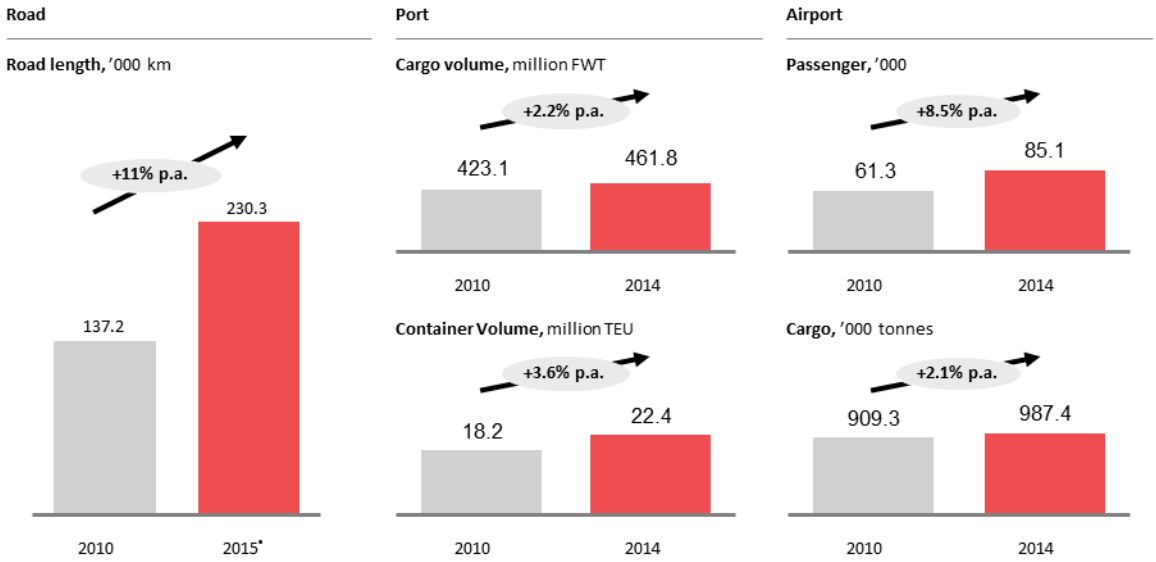
13.1 Transport infrastructure is central to economic and social development with its function to mobilise people and goods. The development of high quality transport infrastructure and delivery of efficient transportation services are fundamental enablers to improve the standard of living. The transport component index of the Malaysia Wellbeing Index 2013 improved by 36.9 points from 2000 to 2012. In addition, enhancement in the transport system during the Tenth Malaysia Plan, 2011-2015 period resulted in better connectivity, increase in road length, ridership and modal share, as well as improved capacity of ports and airports.

13.2 Rapid socio-economic development has outpaced the development of transportation infrastructure and related services, which resulted in bottlenecks such as road congestion, inadequate public transport services and limited accessibility to ports. The changing environment requires more integrated, better targeted and comprehensive solutions. Moving forward, the Eleventh Malaysia Plan, 2016-2020 aims to provide a seamless transport system through the development of transport infrastructure and services. Focus will be placed on improvement in inter-modal connectivity, accessibility and capacity of transportation infrastructure, coupled with integrated planning and strengthening of the regulatory framework.

II. TENTH MALAYSIA PLAN, 2011-2015: PROGRESS

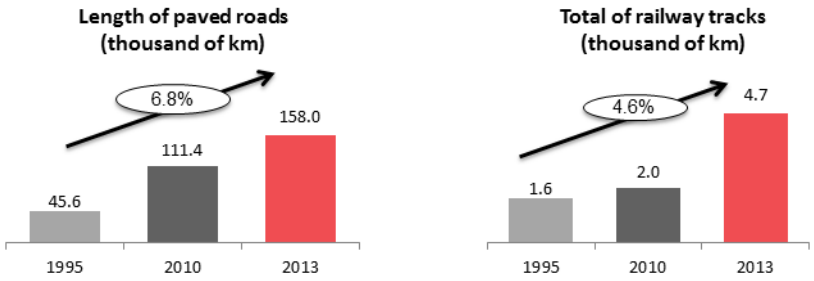
13.3 In the Tenth Plan, the Government placed strong emphasis on the development of transport infrastructure, namely road, airport, port and rail to serve the needs of the people and the industries. This development brought increased benefits to the people. For instance, air passengers carried reached 85.1 million in 2014 as compared to 61.3 million in 2010, as shown in *Exhibit 13-1.* According to the Global Competitiveness Report 2014-2015, Malaysia ranked 25 for infrastructure out of 144 countries. This achievement was made possible with the development in transport infrastructure such as increased length of paved roads and railway tracks as well as expanded capacity of port and airport, as shown in *Exhibit 13-2*. A bigger role of the private sector in providing funds to support infrastructure development, particularly highways, also contributed to infrastructure improvement.

Exhibit 13-1
Highlights of Road, Port and Airport Growth



[e] Estimated
Source: Economic Planning Unit and Ministry of Transport

Exhibit 13-2
Improvement in Transport Infrastructure



Source: Economic Planning Unit, Ministry of Works and Ministry of Transport

Road

13.4 During the Tenth Plan period, road development focused on improving nationwide linkages for better connectivity. Construction of new roads and upgrading of existing roads are expected to increase road length by 68% from 137,200 kilometres in 2010 to 230,300 kilometres in 2015. This will result in a rise in the National Road Development Index (RDI)[1] from 1.42 in 2010 to an expected 2.29 in 2015. The improved RDI is partly attributed to the opening up of new major road linkages such as Lebuh Raya Pantai Timur from Jabor to

[1] RDI is an indicator of the quality of road development which takes into account the length of the road network, land area and population. Generally, if RDI> 1.0, it shows the level of the road network is good as well as be able to accommodate the current traffic demand while generating socio-economic activities. Higher RDI values reflect a more sustainable road development.

Kampung Gemuruh in Terengganu, Simpang Pulai-Lojing-Gua Musang Road, Sultan Abdul Halim Muadzam Shah Bridge (Penang Second Bridge) and South Klang Valley Expressway. Further improvements to the road network will be achieved upon completion of various projects under construction such as the Pan Borneo Highway in Sabah and Sarawak, Central Spine Road from Kuala Krai in Kelantan to Simpang Pelangai in Pahang.

13.5 The road maintenance programme is continuously undertaken to ensure safety and provide comfort to road users. During the Plan period, a total of RM4.3 billion was allocated for federal road maintenance. However, corrective maintenance was more prominent than preventive maintenance as funds were limited. Under the road safety programme, 140 accident-prone spots were improved as road conditions contributed to 8% of road accidents. A total of 18 pedestrian bridges were constructed to improve safety of pedestrians, particularly school and university students. This programme contributed to a reduction in the road fatalities rate from 3.4 deaths per 10,000 registered vehicles in 2010 to 2.9 in 2013.

13.6 Road connectivity improvement in rural areas promotes growth and mobility as it provides economic opportunities and accessibility to education, health and other social services. Under the National Key Result Area (NKRA) programme, a total of 4,554 kilometres of rural roads were built, which exceeded the target of 3,826 kilometres. By the end of 2015, rural road length is expected to increase, spanning over 1,624 kilometres in Sabah, 1,376 kilometres in Sarawak and 2,050 kilometres in Peninsular Malaysia, totalling 5,050 kilometres.

Port

13.7 The port sector continued to maintain its international performance. In 2013, Port Klang, Selangor which handled 10.4 million twenty-footer equivalent units (TEUs) and Port of Tanjung Pelepas (PTP), Johor which handled 7.6 million TEUs were ranked 13 and 19 respectively, in the International Association of Ports and Harbours World's Top 20 Container Port report. Total cargo throughput recorded an average annual growth rate of 2.21% between 2010 and 2014, as shown in *Exhibit 13-3*.

Exhibit 13-3

Total Cargo Throughput, 2010-2014

Type of Cargo		2010	2011	2012	2013	2014	Average Annual Growth Rate (%)
		('000 FWT)					
1.	Dry Bulk	37,131	45,414	39,297	37,075	36,160	*-0.66*
2.	Liquid Bulk	75,479	79,244	66,455	69,135	68,848	*-2.27*
3.	General Cargo	19,358	20,471	19,567	20,512	21,389	*2.53*
4.	Containerised Cargo	291,150	321,751	325,838	331,804	335,418	*3.60*
	Total	**423,118**	**466,880**	**451,157**	**458,526**	**461,815**	***2.21***

Notes: FWT refers to freight weight tonnes
Source: Economic Planning Unit and Ministry of Transport

13.8 Development and upgrading of port facilities were continuously carried out in line with economic growth and the expanding maritime industry. As stipulated in the respective concession agreements, all expenses for port development were borne by port operators. Some major developments undertaken during the Plan period are as listed in *Exhibit 13-4*.

Exhibit 13-4

Port Development, 2011-2015

Port	Development and upgrading works
Port Klang, Selangor	• Construction of 900 metres additional container wharf and reclamation of land for future expansion at Westports. • Construction of 300 metres of container wharf at Northport, which increased container handling capacity from 12.2 million TEUs to 17 million TEUs. • The Port Klang Authority deepened the south channel from 16.5 metres to 18 metres to cater for vessel of 18,000 TEUs.
PTP, Johor	• Construction of an additional 700 metres container wharf, which increased container handling capacity from 8.5 million TEUs to 10.5 million TEUs.
Kuantan Port, Pahang	• Construction of an additional 600 metres cargo wharf, which increased the cargo handling capacity from 18 million tonnes to 21 million tonnes.
Johor Port, Johor	• Upgrade break bulk jetties and break bulk wharf.
Penang Port, Pulau Pinang	• Development of 600 metres container wharf and related equipment as well as the reclamation of 25 hectares for container yard which was completed in 2012 resulted in an increase in the capacity of container handling from 1 million TEUs to 2 million TEUs.
Tanjung Manis Port, Sarawak	• Expansion and refurbishment of facilities which increased the capacity from 800,000 tonnes for bulk cargo and 85,000 TEUs for container cargo to 2.5 million tonnes and 180,000 TEUs, respectively.
Sepanggar Bay Container Port, Sabah	• Procurement of two units of ship-to-shore cranes to increase the efficiency of container handling.

Source: Ministry of Transport

Airport

13.9 The civil aviation industry recorded strong growth that further promoted air travel, particularly for tourism and high value freight. Government investment was focused on expanding airport capacity and improving airport connectivity including to the rural areas. In addition, the Government ratified the ASEAN Open Skies Agreement in 2013, which paved the way for liberalisation of air transport services.

13.10 The Government also carried out airport upgrading works to increase airport capacity and passenger comfort. These upgrading works were undertaken in Kota Kinabalu International Airport and Sandakan Airport in Sabah as well as Miri Airport in Sarawak. The construction of a new airport in Mukah, Sarawak commenced in 2014 to replace the current short take-off and landing airstrip (STOLport) to improve rural connectivity.

13.11 Total passengers handled by all airports increased from 81 million in 2013 to 85 million in 2014 and is expected to reach more than 90 million in 2015. In addition, 938,770 metric tonnes of cargo were handled in 2013 and 987,420 metric tonnes in 2014 and is expected to record more than 995,000 metric tonnes in 2015. A total of 834,000 aircraft movements were registered in 2014 as compared to 885,000 movements in 2013 and this is expected to reach more than 850,000 movements in 2015, as shown in *Exhibit 13-5*.

Exhibit 13-5
Traffic Handled at Airports, 2010-2014

Description	2011	2011	2012	2013	2014	Average Annual Growth Rate (%)
Passengers ('000)						
• International	30,528	30,462	32,397	38,032	39,984	6.98
• Domestic	30,781	34,239	35,634	42,971	45,104	10.02
Total	**61,309**	**64,701**	**68,031**	**81,003**	**85,088**	**8.54**
Cargo ('000 tonnes)						
• International	743.25	551.89	712.46	728.86	805.88	2.04
• Domestic	166.17	170.51	167.27	166.36	181.53	2.23
Total	909.42	681.69	879.73	938.77	987.42	**2.08**
Aircraft Movement ('000)	**590**	**861**	**846**	**885**	**834**	**9.04**

Notes: Figures do not include transit passengers and cargo
Source: Economic Planning Unit and Ministry of Transport

13.12 In 2014, there were 64 airlines operating at Kuala Lumpur International Airport (KLIA) as compared to 58 airlines in 2010. Among the new and returning airlines were Air France, Hong Kong Airlines, Iraqi Airways, Malindo Air, Regent Airways, Shanghai Airlines and Turkish Airlines. In 2014, traffic growth at KLIA in terms of passenger movement recorded 5% growth as compared to 2013.

Public Transport

13.13 During the Tenth Plan period, Land Public Transport Commission (SPAD) implemented four strategies which focused on strengthening the regulatory framework, increasing transport capacity, promoting seamless connectivity and establishing a robust monitoring and enforcement mechanism.

13.14 The National Land Public Transport Master Plan, 2012-2030, was formulated to drive the regulatory and industry reform. The Master Plan sets a 20-year timeline which targets to increase public transport modal share for urban areas from 16.4% in 2011 to 40% in 2030 and improves public transport access to rural areas. The Master Plan will guide the formulation of regional master plans and the preparation of policy guidelines in areas such as travel demand management, transit-oriented development (TOD) as well as integration and interchange development. In addition, a new fare policy for all modes of public transport was initiated. In terms of industry reform, the Stage Bus Services Transformation (SBST) Programme was introduced in 2015 targeting to improve operator viability and expand bus route coverage by migrating from the fare-box revenue collection model to the gross-cost service delivery contract model[2]. The SBST Programme was rolled out to five cities namely Seremban, Kuching, Kangar, Ipoh and Kuala Terengganu in 2015.

13.15 Investments to improve public transport capacity were focused on upgrading and rehabilitating existing infrastructure, constructing new rail lines, extending existing lines and procuring new rolling stock. New investments to expand urban rail network include the Express Rail Link (ERL) extension from KLIA's main terminal to KLIA2 and light rail transit (LRT) extension from Kelana Jaya to Putra Heights and Sri Petaling to Putra Heights. The construction of the Klang Valley Mass Rapid Transit (KVMRT) Line 1 from Sungai Buloh to Kajang started in 2012. The LRT extension and KVMRT Line 1, once operationalised in 2016 and 2017 respectively, are estimated to increase the daily ridership of urban rail in Greater Kuala Lumpur/Klang Valley (GKL/KV). In addition, the construction of the electrified double-track railway from Padang Besar, Perlis to Gemas, Negeri Sembilan, completed during this period, complemented efforts to relieve congestion on roads as well as facilitate freight movement by rail. Major investments made by each mode are as shown in *Exhibit 13-6.*

[2] Gross-cost service contract model is a business model whereby operations would be financed by contractual income to be received from the government based on agreed service level performance.

Exhibit 13-6

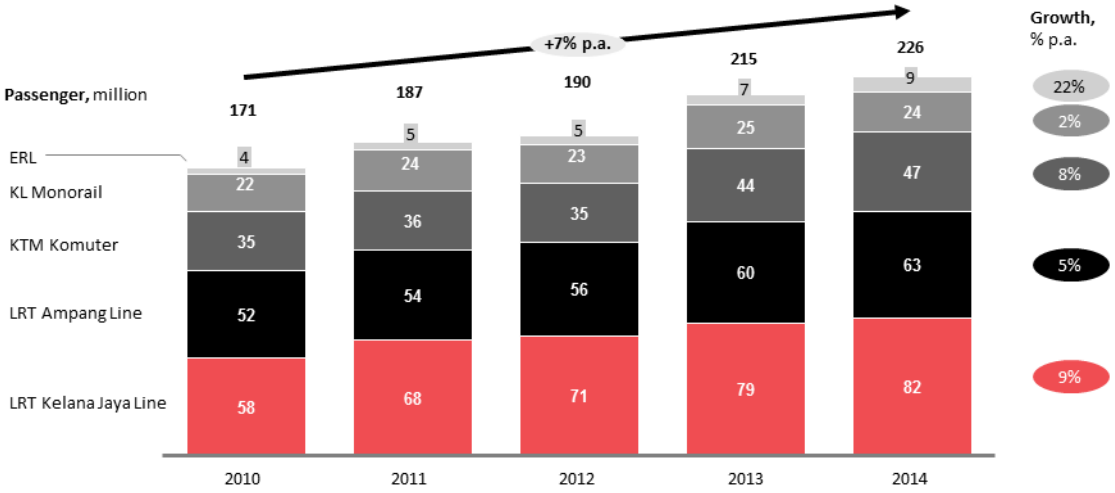
Major Investments by Modes

Mode	Upgraded Services	New Services
Bus	• 470 new buses were added for Rapid KL, Rapid Kuantan and Rapid Penang • 1,388 bus stops were built & refurbished • Free services of 2 Go-KL routes around Kuala Lumpur Central Business District • 9 Bus Express Transit corridors for GKL/KV • Established Command and Control Centre and Performance Monitoring Hub System to monitor performance of all bus operators in GKL/KV	• Sunway Bus Rapid Transit (PPP model)
Rail	• 35 four-car sets for LRT Kelana Jaya Line • 38 six-car sets for KTM Komuter • 12 four-car sets for KL Monorail • Extension of Electrified Double-Track Railways to Padang Besar • Rehabilitation of KTM Komuter tracks	• KVMRT Line 1 – Sungai Buloh to Kajang • LRT Kelana Jaya Line extension from Kelana Jaya to Putra Heights • LRT Ampang Line extension from Sri Petaling to Putra Heights
Taxi	• New taxi business model to tackle issues of maintenance and financing packages • Teksi Rakyat 1Malaysia (TR1Ma) consists of: ○ *Bantuan Tayar* 1Malaysia (BT1M), a scheme which Government provides a tyre replacement subsidy voucher worth RM520 for 2,264 taxis to replace tyres ○ new operating licenses given to 1,000 new Teksi 1Malaysia (TEKS1M) individual taxi drivers	• Centralised Taxi Service System is a comprehensive system designed to enhance the monitoring of taxis and help in enforcement against negligent operators

Source: *Suruhanjaya Pengangkutan Awam Darat*

13.16 In terms of rail development, the Government recognised the need to further improve and enhance existing rail infrastructure and level of services together with new investments in expanding urban rail network coverage, particularly in the GKL/KV region. The annual ridership of urban rail increased by 31.7% from 171 million in 2010 to 226 million in 2014. The increasing number of ridership shows that there is demand in usage of public transport, especially in the urban area. The annual ridership on urban rail network in GKL/KV from 2010 to 2014 showed an increasing trend, as shown in *Exhibit 13-7.*

Exhibit 13-7
Annual Ridership Trend Urban Rail in GKL/KV



Source: Suruhanjaya Pengangkutan Awam Darat

13.17 Provision of integrated facilities is pertinent in ensuring people opt for public transport. Efforts were undertaken to improve integration between modes to promote seamless mobility. During the Plan period, construction of two integrated transport terminals, *Terminal Bersepadu Selatan* and *Pudu Sentral* in Federal Territory (FT) Kuala Lumpur, were completed. In addition, emphasis was given to provide first- and last-mile connectivity by extending pedestrian walkways, building parking facilities at terminals and revitalising inter-urban terminal hubs. Integrated facilities provided under the Plan period are as shown in *Exhibit 13-8.*

Exhibit 13-8

Initiatives to Promote Integration

Priority Areas	Initiatives
First-mile connectivity	• Construction of Park 'n' Ride facilities at key public transport stations in Gombak, Kelana Jaya, Rawang, Serdang, Salak Tinggi, Taman Paramount, Taman Bahagia, and Universiti Kebangsaan Malaysia in Selangor, as well as Nilai and Seremban in Negeri Sembilan • Provision of 7,000 additional parking bays across key rail stations by 2016 • Construction of parkway drop-zone facilities at Petaling Jaya, Serdang and Shah Alam in Selangor • Installation of Passenger Information System at 59 bus stops which tracks locations of bus using Global Positioning System (GPS)
Mid-mile connectivity	• Completion of Integrated Transport Terminals at Bandar Tasik Selatan, Selangor, which integrates intercity busses with urban rails • Refurbishment of Puduraya Bus Terminal (known as Pudu Sentral) • Completion of Integrated Regional Bus Terminal in Kuching, Sarawak • Completion of Pasar Seni Bus Hub, which improves integration between bus and rail services • Construction of Hentian Akhir Bandar at Petaling Jaya, Shah Alam and Selayang in Selangor • Introduction of single ticket journey for LRT Kelana Jaya and Ampang Lines seamless ticketing on bus services operated by Rapid
Last-mile connectivity	• Completion of Skywalk at Pudu Sentral, WP Kuala Lumpur • Construction of 4km of pedestrian linkages in KL CBD

Source: Performance Management and Delivery Unit (PEMANDU) and *Suruhanjaya Pengangkutan Awam Darat*

13.18 In ensuring effective implementation of the programmes to improve public transport, a robust performance monitoring mechanism and enforcement system was established. Several Key Performance Indicators (KPIs) were introduced to monitor the GKL/KV initiatives such as modal share, ridership and network coverage. In 2014, the public transport modal share in GKL/KV increased to 17.1% as compared to 16.9% in 2010, while the morning peak ridership increased to 747,859 from 314,965. Network coverage, measured by population living within 400 metres of public transport nodes, also improved to 72% in 2014 from 63% in 2010. The performance of these KPIs is shown in *Exhibit 13-9.*

Exhibit 13-9

Public Transport Performance in GKL/KV, 2010-2015

Key Performance Indicators	Performance					Target
	2010	2011	2012	2013	2014	2015
Public transport modal share (%)	*16.9*	*16.4*	*19.6*	*20.8*	*17.1*	*25.0*
Morning peak ridership (numbers)	314,965	521,589	635,245	827,771	747,859	550,000
Population living within 400m of public transport nodes (%)	*63.0*	*67.0*	*72.0*	*71.0*	*72.0*	*75.0*

Source: *Suruhanjaya Pengangkutan Awam Darat*

13.19 The annual ridership of the stage bus in 11 capital cities recorded mixed performance, as shown in *Exhibit 13-10* where four capital cities recorded an increase while seven other cities showed decreasing growth between 14.5% and 25.1%. For GKL/KV area, the stage bus annual ridership increased by 10% in 2014 as compared to 2012 whereas the rail annual ridership grew by 18.7% during the same period. This shows a shift in commuter preference from bus to rail services. *Exhibit 13-11* shows public transport annual ridership in GKL/KV between 2012 and 2014.

Exhibit 13-10

Stage Bus Annual Ridership in Selected Capital Cities

Cities	('000 passenger)		Growth (%)
	2012	2014	
Kangar	372	238	*-36.0*
Alor Setar	2,490	1,865	*-25.1*
Georgetown	10,704	17,856	*66.8*
Ipoh	7,632	6,509	*-14.7*
Shah Alam	18,171	13,634	*-25.0*
Seremban	5,231	4,936	*-5.6*
Melaka	3,212	5,624	*75.1*
Johor Bahru	29,417	24,440	*-16.9*
Kuantan	411	4,134	*905.8*
Kuala Terengganu	509	435	*-14.5*
Kota Bharu	1,869	3,308	*77.0*
Total Annual Ridership	**80,018**	**82,979**	***3.7***

Source: *Suruhanjaya Pengangkutan Awam Darat*

Exhibit 13-11

Public Transport Annual Ridership in GKL/KV by Modes

Mode	2012		2014		Growth (%)
	('000)	%	('000)	%	
Stage bus	128,780	40.0	141,673	39.0	*10.0*
Rail	190,000	60.0	225,615	61.0	*18.7*
Total	**318,780**	**100.0**	**367,288**	**100.0**	***15.2***

Source: *Suruhanjaya Pengangkutan Awam Darat*

III. ISSUES AND CHALLENGES

13.20 It is expected that mobility demand will reach 72 million trips per day by 2020 as compared to 40 million trips per day in 2010. In meeting this demand, there are several issues and challenges that need to be addressed including lack of connectivity, inadequate capacity and insufficient fund as well as uncoordinated planning and implementation. Even though most of these issues are common to all transport modes, different treatments are needed for each of the modes.

Road

13.21 Road congestion is prevalent due to high vehicle usage. Lack of a good maintenance regime results in degradation of road conditions. In addition, insufficient road connectivity to rural areas reduces accessibility and potential economic opportunities. Although various road safety measures are being undertaken, the increase in road accidents remains a major concern.

Increasing Level of Road Congestion

13.22 One of the main challenges faced by road users is the increasing level of road congestion in major cities and trunk roads. In 2010, about 30% of roads were categorised as having very heavy traffic flow. This worsened to 44% in 2013 mainly due to the increase in vehicle ownership. The number of registered vehicles increased from 10.6 million in 2000 to 23.7 million in 2013, as shown in *Exhibit 13-12*. Consequently, there is an increase in vehicle per capita from 455.6 vehicles per 1,000 population in 2000 to 792.4 in 2013. The increasing vehicle ownership and high percentage of single occupant vehicles were attributed to inefficient public transport, particularly in cities. The Kuala Lumpur City Plan 2020 reported that 70% vehicle trips crossing the Middle Ring Road I and II during morning peak hours are single occupant vehicles.

Exhibit 13-12

Population and Vehicle Registered, 2000-2013

Year	Population	Vehicles Registered	Vehicle per capita [1]
2000	23,263,600	10,598,804	455.6
2005	26,130,000	15,026,660	575.1
2010	28,910,000	20,188,565	698.3
2013	29,915,300	23,705,794	792.4

Notes: [1] Calculated as vehicle per 1,000 population
Source: Road Transport Department and Department of Statistics

13.23 Measures undertaken to ease road congestion by building highways into city centres do not always alleviate the problem but instead transfer bottlenecks. For instance, traffic congestion in Jalan Tun Razak, Kuala Lumpur has worsened with the opening of the Kuala Lumpur-Putrajaya Expressway (MEX) that serves users from the southern area of GKL/KV. Despite paying toll, road users still endure massive congestion on major urban highways such as the Damansara-Puchong Highway (LDP), New Pantai Expressway (NPE) and Duta-Ulu Klang Expressway (DUKE).

Inadequate Road Maintenance

13.24 Preventive and corrective road maintenance is important to ensure safety and comfort of road users. However, shortage of funding causes preventive road maintenance being less prioritised over corrective maintenance. In addition, as more roads are being built to improve linkages, bigger allocation is required to maintain these roads. In 2013, only RM850 million was allocated for federal road maintenance as compared to a total of RM1.5 billion needed. The lack of a good maintenance regime results in degradation of road conditions thus reducing their lifespan and inevitably increasing maintenance cost.

Ineffective Road Safety Measures

13.25 Various road safety measures were undertaken to overcome accidents, such as construction of motorcycle lanes and pedestrian bridges as well as treatment of blackspots. However, the impact of these measures remains minimal as road accidents continually increase over the years. Road accidents recorded an increase of 15.1%, from 414,421 cases in 2010 to 477,204 cases in 2013, as shown in *Exhibit 13-13.* The increasing number of accidents remains a critical problem as it incurs economic and social losses to the country.

Exhibit 13-13
Road Accident in Malaysia, 2000-2013

Year	Road Accidents	Road Casualties	Road Deaths
2000	250,429	50,200	6,035
2005	328,264	47,012	6,200
2010	414,421	28,269	6,872
2013	477,204	19,237	6,308

Source: Malaysian Institute of Road Safety Research

Insufficient Road Connectivity to Rural Areas

13.26 Rural connectivity is still insufficient despite increasing focus and funding by the Government. In general, a more extensive road network is required to cover rural areas due to geographical characteristics and scattered population, especially in Sabah and Sarawak. In addition, road construction cost in remote areas of Sabah and Sarawak is more expensive as compared to other states due to high mobilisation cost of equipment and raw materials. This poor connectivity to the rural areas reduces potential economic opportunities and accessibility to basic social amenities and services such as health and education.

Port

13.27 International trade volume will continue to increase in the mid- to long-term resulting in port congestion. The volume of cargo handled at ports will exceed their capacity within the next few years as trade with Asian countries, primarily from the People's Republic of China, increases. In addition, the increasing use of larger ships will necessitate the deepening of access channels which will require higher investments. Lapses in land side connectivity, limited accessibility to ports, limited availability of land for future expansion, lack of an integrated ICT system and lack of policy to govern development of ports and private jetties continue to affect the efficiency of port operations.

Lapses in Land Side Connectivity

13.28 Port operations require vital linkages between sea and land side. However, land side connectivity improvement is not in tandem with the growth in freight movement. The present condition of the road network is not able to cater for the heavy volume of traffic to and from the ports. One of the main challenges faced is availability of land for road and rail expansion leading to ports.

Limited Accessibility to Ports

13.29 The trend in shipping focuses on pursuing greater economies of scale to generate lower unit cost by using bigger capacity vessels catering more than 18,000 TEUs container ships. To accommodate such mega vessels like the Maersk 3E vessel, the ports need draught of at least 18 metres. In the case of Port Klang and PTP, which are hub ports, their access channels have to be dredged to at least 18.5 metres. However, due to the inability of port operators to raise funds for capital dredging, the works were delayed, thus limiting the port capability to accept mega ships at all times. Government funding is limited and port operators find it difficult to obtain private funding for non-tangible assets such as dredging works. For example, the estimated cost for dredging Sungai Sarawak from a depth of 7.5 metres to 9 metres to cater for Kuching Port requires RM360 million, while the deepening of the channel in PTP from 16.5 metres to 18.5 metres is estimated to cost RM1.2 billion. This has caused limited accessibility to ports affecting their competitiveness.

Limited Availability of Land for Expansion

13.30 The availability of land for port expansion is limited due to competing utilisation with property development which is a prerogative of states. In addition, state governments have given reclamation concessions to third parties, resulting in port authorities or operators having to pay high acquisition costs for the land. Land reclamations are also required where there is lack of land and this will increase the cost of port development. These constraints have a significant impact on port operations and growth.

Lack of Port Community System (PCS)

13.31 Ports experience bottlenecks for international trade due to complex and time consuming processes and procedures. Excessive manual paperwork and duplication of processes contribute to a high degree of inefficiencies. This causes delays in movement of goods through ports as well as hinders efficient information and data exchange among stakeholders. Currently, some ports have their own PCS. However the systems are not connected and differ from one port to another. For example, the Port Klang Authority has developed a PCS called Port Klang Net (PKN), which connects their two operators and stakeholders under one portal.

Lack of Policy to Govern Development of Ports And Private Jetties

13.32 Taking into consideration changes in global trade and shipping trends and to ensure ports remain competitive, there is a need for coordinated planning of port development. Currently, ports are developed individually without comprehensive spatial planning and demand analysis as there is no governing policy for the development of ports and private jetties. While main ports are administered by the various port authorities, numerous minor ports and jetties are under the Marine Department, Ministry of Transport (MOT). The presence of various authorities has resulted in uncoordinated planning of ports and jetties. There is also no integrated long-term planning and improvement of port facilities, such as maintenance of jetties and navigational channels. In some areas, the presence of too many ports and jetties in the same vicinity has created unhealthy competition resulting in their underutilisation.

Airport

13.33 Malaysia maintains its position as Council Member of the International Civil Aviation Organisation (ICAO) since 2007 and has since increased its participation in the international aviation industry. As one of the signatory countries of the Chicago Convention 1944, Malaysia has obligation to comply with international regulations and standards set forth by the ICAO. In this regard, gaps in the institutional and regulatory framework need to be addressed. In addition, the Department of Civil Aviation (DCA) is faced with shortage of qualified technical personnel (QTP) and system infrastructure that needs to be updated. There are also constraints on rural air services (RAS) in terms of operations and infrastructure, which affect connectivity to interior areas.

Weak Institutional and Regulatory Framework

13.34 The Government aspires to strengthen the civil aviation industry as an economic enabler. However, there are many outstanding issues between the industry players and the regulatory body. There is a need for a structural transformation to streamline the legislative framework and rationalise the roles of authorities that are responsible for safety and economic regulatory functions of the civil aviation industry.

13.35 Heavy investments in airport infrastructure sometimes lead to over capacity of airports that require high maintenance cost. The institutional and regulatory framework needs to be strengthened to address issues of over-investment in airport facilities and to streamline all airports according to its hierarchy namely, international airports, domestic airports and STOLports.

Shortage of Qualified Technical Personnel

13.36 The shortage of quality and competent human resource has limited the DCA's capacity to fully undertake its regulatory functions. There is a high turnover of QTP, especially the pilots that carry out inspection for air route calibration, due to the more attractive salary packages offered by the private sector. At present, the Flight Operations Sector of the DCA is operating on a 40% human resource capacity due to the shortage of pilots. In addition, DCA also lacks air traffic controllers in providing efficient and orderly flow of air navigation services as training of these officers require one and a half years before they are able to be on the job.

Lapse in System and Airport Infrastructure

13.37 The air navigation infrastructure, mainly the radar system and navigational aids, need to be upgraded to improve their effectiveness with respect to safety and to minimise economic losses to the aviation industry. In addition, compliance to international requirements and standards as well as changing technology has made it necessary for these infrastructures to be upgraded and replaced. Inefficient air traffic management (ATM) limits aircraft movement capacity and incurs additional cost to airlines. Furthermore, an extremely high growth of passengers and aircraft handling at the Sultan Ismail Petra Airport, Kelantan due to increased frequency of existing and new airlines to Kota Bharu, have resulted in capacity constraints and congestion at the airport during peak hours, delaying scheduled flights.

Constraints on Rural Air Services

13.38 MASwings, under the RAS operating agreement has an obligation to provide rural air services connectivity in Sabah and Sarawak, as well as some international flights for Brunei-Indonesia-Malaysia-Philippines East Asia Growth Area (BIMP-EAGA) destinations. While the intent is to provide low cost connectivity, MASwings has to compete with MAS and AirAsia on some routes. Although the airline receives an annual subsidy, it is unable to cover its operating expenses due to the capped fares, which affect its operations. As a result, the connectivity to rural areas served by air will be affected.

13.39 Some STOLports are facing capacity constraints due to lack of infrastructure improvement. For example, Lawas STOLport in Sarawak is situated close to the river and subjected to flooding that affects the operations. Flights are cancelled and need to be rescheduled during floods and for cleaning work to be carried out.

Public Transport

13.40 Based on estimated annual economic growth of 5% to 6%, mobility demand will reach 72 million trips per day by 2020 from 40 million in 2010. The majority of these trips will be in urban areas, in tandem with the expected increase in urban population from 67% in 2010 to 75% by 2020. In addressing increased mobility demand, the Government continues to invest in public transport capacity and service expansion. Despite various efforts for improvement, there are still challenges in providing sufficient capacity and optimal service standards of urban transport as well as accessible public transport coverage in rural areas. In addition, the lack of coordination among agencies further hinders progress of public transport development.

Insufficient Public Transport Capacity

13.41 The majority of cities and towns are served by stage buses and taxis, except in the GKL/KV, which is also served by urban rail. Based on a public transport survey on GKL/KV, public transport annual ridership showed an increase of 15.2% in 2014 as compared to 2012. However, the public transport modal share remains low at 17.1% as compared to the target of 25%. Insufficient public transport capacity to cater for mobility demand in GKL/KV has resulted in high usage of private vehicles.

Lack of Coordination Among Agencies

13.42 The task in transforming public transport is led by SPAD in coordination with various agencies. However, lack of coordination among agencies in planning and implementation of various transport initiatives has resulted in inefficient use of resources such as provision of urban rail and highways in the same corridor. In addition, public transport improvement demands greater integration with land-use planning, which requires the involvement of local authorities. Although SPAD has established public transport committees at state level to guide and consult state governments and local authorities, such committees lack effectiveness in carrying out public transport improvement plans.

Sub-optimal Public Transport Service Standards

13.43 Public transport services are primarily operated by private entities, which are dependent on fare collection as the sole source of revenue. However, the majority of operators are unable to collect sufficient revenue as fares are capped. As such, they compromise on service delivery to remain sustainable. As an example, express bus operators reduce frequencies to run only on weekends and remain unproductive for the rest of the week. Across all modes, the majority of operators rely on old infrastructure and

rolling stock, affecting their operations and service quality. Challenges related to service quality by modes are as per *Exhibit 13-14.*

Exhibit 13-14
Challenges by Different Modes

Mode	Challenges
Buses	• Increased in operating expenses due to no revision of fares since 2009 and minimal incentives of subsidised diesel • Non-recoverable toll charges from passengers • Insurance rate is based on passenger capacity which is burdensome as they have to pay higher insurance despite low fares • Seasonal demand • Shortage of drivers
Rail	• Capital intensive investment requires large ridership to be sustainable • High operating expenses • Old infrastructure and rolling stocks
Taxis	• Lack of industry standard • Complexity in monitoring of licence conditions issued to company-based and individual operators • Traditional enforcement as application of Intelligent Transport System (ITS) is not been in place
Riverine transport	• Restricted operations of water transport in Sarawak due to lack of night navigation aids • Insufficient jetties • Low compliance to international standards on safety

Source: *Suruhanjaya Pengangkutan Awam Darat*

Insufficient Public Transport Services in Rural Areas

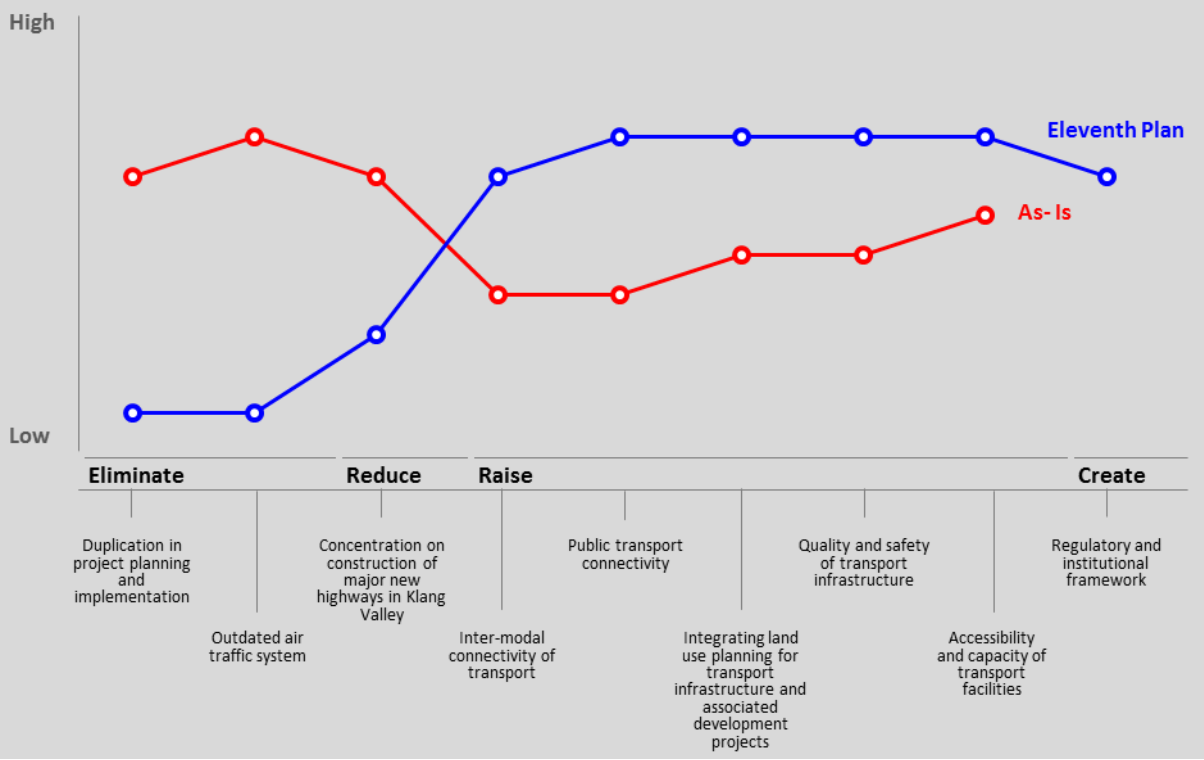
13.44 Insufficient public transport services in rural areas are mainly due to low demand and high operating cost. The low demand causes the operators to bundle their services which leads to unreliable services. Lack of public transport services has encouraged the use of private vehicles mainly motorcycles and mushrooming of unlicensed service operators.

IV. ELEVENTH MALAYSIA PLAN, 2016-2020: WAY FORWARD

13.45 The focus of transport infrastructure development during the Eleventh Plan will be on greater utilisation of existing facilities with emphasis on better delivery, quality of services and capacity improvement. Network expansion will focus on connecting underserved areas. Integrated transport planning will be geared towards providing mobility and connectivity for goods and people. Towards achieving this, better coordination and collaboration between various stakeholders is required. Strategies for transport infrastructure development during the Plan period are as shown in *Exhibit 13-15*.

Exhibit 13-15

Strategy Canvas for Transport Infrastructure Development



Road

Prioritising Regional Connectivity for New Highways

13.46 Highway development will be focused outside the Klang Valley and other urban areas to provide regional connectivity to new growth areas and maximise the potential of cities to achieve balanced economic development. In order to sustain the growth in Klang Valley and other major cities including Georgetown, Pulau Pinang; Johor Bahru, Johor; and Kota Kinabalu, Sabah, priority will be concentrated in further improving public transport services and reducing traffic congestion.

13.47 Road infrastructure development continues to be vital in fostering growth and development of the economy. The Highway National Development Plan (HNDP) will be used to identify roads for upgrading and new alternative routes. Thus, a comprehensive needs analysis will be implemented in road planning to ensure effective decision-making.

13.48 Emphasis will be given on new highway projects, which act as a catalyst to support economic growth outside major cities. For instance, the Pan Borneo Highway is expected to promote better connectivity for movement of people, goods and services in Sabah and Sarawak. Further development of the Central Spine Road, Kota Bharu–Kuala Krai Highway and Lebuh Raya Pantai Timur will improve connectivity in Peninsular Malaysia and catalyse growth in the east coast region as well as reduce the urban-rural development gap. The completion of the West Coast Expressway in 2019 is expected to provide better access to the west coast of Perak and Selangor.

Shifting Towards Preventive Maintenance

13.49 Maintaining assets in good condition is crucial to ensure the road network continues to be effective and serves its functions to the required quality standards throughout its lifespan. The life-cycle costing approach in planning, implementation and maintenance will be adopted in road development. This approach will allow comparative cost assessments to be made over a specific period of time, taking into account relevant economic factors in terms of initial capital costs, future operational and asset replacement costs. This will enable a shift in focus towards preventive maintenance.

13.50 The durability of road infrastructure will be enhanced by intensifying the utilisation of advanced materials and innovative technology in road construction and maintenance. For instance, the application of new and improved pavement technologies such as polymer modified asphalt, concrete pavement and recycled asphalt pavement in future road construction will increase pavement lifespan and reduce pavement maintenance. The usage of new technology will also be incorporated into road guidelines and specifications. A smooth and reliable road pavement will contribute to lower fuel consumption as well as reduce wear and tear of vehicles.

Improving Road Safety

13.51 Road safety will be improved during the Eleventh Plan period. Existing funds will be optimised to finance road safety enhancement programmes under the Black Spot Mitigation Programme and Road Safety Audit. This will reduce road fatalities by 50% by 2020 as per the recommendations of the United Nations Decade of Action for Road Safety 2011-2020.

13.52 The Black Spot Mitigation Programme will be intensified to reduce the rate of accidents caused by engineering factors. This programme involves rehabilitation works at accident-prone spots. It will also address accident occurrence on state roads as the analysis in HNDP shows a high accident rate especially involving motorcycles on state roads compared to federal roads. In addition, response time to address road hazards, including landslides and potholes, will be shortened.

Extending Connectivity in Rural Areas

13.53 Efforts will be continued to improve connectivity to rural areas. There are still many villages which are not connected by roads, especially in Sabah and Sarawak. Special focus will be given to the development of rural roads to link the less developed areas to the main road network in these states. In particular, a rural-urban network of roads will be constructed in both states to link with the new Pan Borneo Highway.

13.54 The Blue Ocean approach will be used to provide basic road connectivity to remote areas by fully utilising available materials with local labour. The construction of basic roads under the *Jiwa Murni* programme will be continued during the Plan period to provide access to basic social amenities and services such as health and education. This is expected to create economic opportunities for the residents and further alleviate poverty among rural households.

Port

13.55 The focus of the ports subsector will be on improving capacity and strengthening governance, while leveraging ICT and technological solutions to facilitate port activities. The hub ports will also continue to improve their ranking in the World's Top 20 Container Ports. The role of other ports will be streamlined as supporting ports to ensure competitiveness.

Improving Land Connectivity

13.56 Road and rail upgrading as well as integrated planning and development for new linkages will be intensified to promote a multimodal transport system. A built-in mechanism for periodic engagement between all stakeholders and transport planners will be strengthened to avoid fragmented planning. Efforts will be undertaken to shift from road- to rail-based transport in delivering cargo to and from hinterland to port.

Improving Accessibility and Expanding Capacity

13.57 Accessibility to ports will be improved to cater for bigger vessels by undertaking channel deepening works. In addition, various port operators will undertake capacity expansion works, which include building additional berths and wharfs as well as land reclamation. These improvements will attract more international liners and mega vessels with capacities of 18,000 TEUs to call at the major ports. Improvements that will be carried out by port operators are as shown in *Exhibit 13-16*.

Exhibit 13-16

Capacity Improvements to be Carried Out by Port Operators

Port	Improvement Works
Port Klang, Selangor	Development of additional container wharf as well as upgrading of wharf at Northport
Bintulu Port, Sarawak	Refurbishment of existing facilities and construction of additional berth for liquefied natural gas, 400 meter general cargo wharf and supply base terminal
Kuantan Port, Pahang	Dredging and berth construction for the Kuantan Deep Sea Terminal
Penang Port, Pulau Pinang	Deepening of the access channel from 11.5 meter to 14.5 meter
PTP, Johor	Deepening of navigational channel and land reclamation for construction of 700 meter container wharf under phase III expansion programme

Source: Ministry of Transport

Reserving Land Bank for Future Expansion

13.58 As the custodian of federal ports, MOT will integrate land use planning among the different stakeholders through periodic engagements with state and local authorities. This is to ensure a built-in mechanism is in place for every stakeholder to be aware of future port development as stipulated in the respective port development master plan. This will foster mutual understanding and assure commitment from the respective states in order to support the growth of ports.

Creating Port Community System

13.59 All port authorities are required to establish their PCS, which is an open electronic system that enables intelligent and secure information exchange between public and private stakeholders. PCS optimises, manages and automates smooth port and logistics processes through a single submission of data and connects transport and logistics chains. This will help to improve efficiency and competitiveness of port operations and strengthen strategic alliances among stakeholders.

Crafting the National Port Policy

13.60 The National Port Policy will foster systematic development and growth of ports as well as jetties by introducing policy measures and strategy options. It will also provide the legal framework to govern port and jetty development, besides streamlining all ports and jetties according to their functions. The major hub ports will be served by secondary ports, hence strengthening port operations while supporting the national logistics chain.

Airport

13.61 Liberalisation of air services and increasing competition among airlines have generated higher demand for air travel. In addition, promotion activities to attract business and tourist travellers will further increase air travel in the country. To cater for this increase, the airports, specifically the main international gateways, will continue to be upgraded in terms of its capacity and efficiency. Strategies for the airport sector will include strengthening institutional and regulatory frameworks, improving capacity and reviewing RAS.

Establishing the Malaysian Aviation Commission

13.62 The Malaysian Aviation Commission will be an independent regulatory body that oversees national development objectives as well as manages capacity of operators and competition via licensing and route allocation. It will transform the civil aviation institutional and regulatory frameworks, focusing on aviation development including policy and planning, economic regulation and consumer protection, while the technical, safety and security aspects will remain with DCA. This transformation will further intensify efforts to streamline all airports according to their hierarchy, whereby international airports serve as major gateways, domestic airports support the international airports and STOLports serve the rural areas.

Corporatising the Department of Civil Aviation

13.63 The Government will assess options to corporatise DCA to ensure financial and management independence. Corporatisation of DCA will improve the capacity, quality and competency of its human resource. In addition, DCA will review technical, safety and security procedures to provide clear regulations and guidelines to further enhance the civil aviation industry.

Upgrading System and Airport Infrastructure

13.64 A new Kuala Lumpur Air Traffic Control Centre will be built to replace the National Control Centre at Subang, Selangor to improve aircraft movement capacity over the airspace. In addition, the communication, navigation and surveillance as well as air traffic management (ATM) systems will be upgraded to support air traffic movement. The upgraded system will increase aircraft movement at KLIA from 68 per hour to 108 per hour, hence improving the efficiency of KLIA and supporting its growth.

13.65 Sultan Ismail Petra Airport, Kelantan will be upgraded, including runway widening and lengthening, taxiway improvement, terminal expansion as well as enhancing other supporting facilities. The upgraded airport will cater to the increasing travel demand in the airlines industry.

Strengthening Rural Air Services

13.66 The Government will continue to improve RAS by carrying out STOLport improvements. This will include a new upgraded airport in Mukah, Sarawak, as well as the possibility to relocate the Lawas STOLport. The improvement of STOLports will ensure connectivity and safety of rural air services is enhanced. With the purchase of new aircrafts by MASwings (ATR 72 and Viking), the efficiency of RAS will be improved and MASwings will continue to serve as the community airline for Sabah and Sarawak. The RAS routes will be rationalised to ensure sustainable operations and continuity of service.

Public Transport

13.67 Public transport modal share is targeted to achieve 40% in the GKL/KV region and 20% in other capital cities by 2020. To achieve this, focus will be on providing services that are well-connected, accessible, affordable, convenient, reliable and safe to encourage the shift from private vehicles to public transport. Strategies to improve overall public transport services will cater to rural, rural-urban, urban and intercity mobility. Facilities for mobility-impaired persons will be improved particularly at stations and terminals.

Improving Urban Connectivity

13.68 By the end of the Plan period, it is expected that 75% of the population will reside in urban areas. Therefore, concerted efforts to implement the National Land Public Transport Master Plan are crucial. The Master Plan has outlined the travel demand by using passenger per hour per direction (pphpd) for different corridors in the urban areas. Based on the travel demand assessment, identification of suitable modes, namely feeder bus, bus rapid transit

(BRT), monorail, LRT, mass rapid transit (MRT) or commuter will be appropriately determined for implementation. Towards achieving the target of 40% public transport modal share for GKL/KV, the public transport capacity will be expanded through the implementation of new projects such as KVMRT Line 2 (Sungai Buloh-Serdang-Putrajaya), LRT3 (Bandar Utama-Klang) and monorail for Putrajaya and Cyberjaya as well as the BRT KL-Klang corridor.

13.69 Public transport modal share for other capital cities are targeted at 20% from the current rate between 3% and 8%. Towards realising this target, studies will be carried out to identify the pphpd for each corridor in major cities with focus on integrated transport planning. During the Plan period, stage bus services will be revamped under the Stage Bus Services Transformation (SBST) Programme through migration of the current fare-box collection model to gross-cost service contract model. The SBST Programme will be extended to other cities and rural areas.

Improving Intercity Connectivity

13.70 The Master Plan, in addition to identifying public transport requirements for urban areas, outlines measures to improve the intercity connectivity. Rail will be the transport backbone in facilitating intercity mobility. Major public investments for rail will focus on upgrading rail infrastructure and extending electric train services to other cities. During the Plan period, KTMB will continue its transformation exercise to improve its overall operations, including restructuring its organisational structure, rationalising routes as well as reviewing fare and freight charges. This transformation will also enable KTMB to provide better services to the public and achieve financial sustainability.

13.71 Bus services will be rationalised to make it efficient, affordable and safe. Under this Plan, the express bus network will also be restructured for more regular and frequent services without neglecting low demand areas.

Improving Rural and Rural-Urban Connectivity

13.72 Rural areas need efficient public transport services to facilitate movements within and to urban centres. The SBST Programme will be extended to these areas to improve access to social services and promote economic activities. Small-scale buses will be used to increase the frequency and reliability of public transport for commuting. This programme will complement initiatives by Ministry of Rural and Regional Development to increase road connectivity.

13.73 During the Plan period, innovative and non-traditional public transport service options will be considered for remote areas. An alternative community-based public transport system that offers adequate services will be introduced. The system will deliver a wide range of community-led transport services that cater to both individuals and groups. One of the options is 'dial-a-ride system', which provides door-to-door service through phone calls for people who do not have access to conventional public transport facilities.

13.74 In addressing water transport issues, particularly in Sarawak, the Sarawak Rivers Board will continuously implement improvement programmes as stipulated in the Sarawak Inland Waterway Transport Master Plan. In addition, the Ministry of Infrastructure Development and Communications, Sarawak will undertake assessments to identify alternative modes of transport to reduce reliance on water transport. For remote areas, which are highly dependent on river transport, the safety standards and passenger comfort of the *Tambang* services will be increased.

Introducing National Transport Model

13.75 During the Plan period, a national transport model, which consists of integrated and coordinated analytical tools, will be introduced to strengthen -agency collaboration in formulating integrated transport policies. A national multi-modal land public transport model will be developed to guide the assessment of current and future mobility demand, based on trends in economic and demographic indicators. This model will also facilitate assessment for capacity requirements, which provides important data to agencies, local authorities and developers on types of investments that are needed to deliver the required services. In addition, the tools will also assist ministries and agencies to better analyse land-use planning and potential effect on transportation system development.

Promoting Transit-Oriented Development

13.76 In optimising land use and transport infrastructure in urban areas, -oriented development (TOD) will be promoted to generate higher income for public transport operators. TOD is designed to optimise the utilisation of space, especially in urban areas and to attract private investment for commercial and residential purposes. This is in line with the Urban Revitalisation Programme by the Town and Country Planning Department. TOD will reduce traffic congestion and improve air quality, making cities more liveable. This effort will help towards achieving sustainable development.

V. CONCLUSION

13.77 Developing efficient and affordable transportation networks is imperative in supporting the transformation into an advanced economy and inclusive nation by 2020. Achieving this requires coherent and coordinated efforts to optimise the limited resources and leverage active participation of the private sector. During the Plan period, emphasis will be given to improving inter-modal connectivity, accessibility and capacity of the transportation infrastructure as well as integrated planning and strengthening of the regulatory framework.