Greater Kuala Lumpur/Klang Valley Land Public Transport Master Plan
EXECUTIVE SUMMARY
1 Executive Summary

Background

SPAD (Suruhanjaya Pengangkutan Awam Darat) has developed the National Land Public Transport Master Plan (NLPTMP) to set out the vision and direction for land public transport (LPT) in Malaysia. The purpose is to develop a long term programme to address the current deterioration in land public transport with plans to execute high impact and effective delivery initiatives for a 20-year sustainable national land public transport service. The goal of land public transport is to drive forward the ambition of Vision 2020 and 1Malaysia. These national initiatives seek to transform Malaysia into a fully developed and industrialised nation by sustaining growth of 7% per annum. 1Malaysia is the foundation of the national vision where its goal is to preserve and enhance unity in diversity. As part of this, SPAD aspires to ‘Transform public transport to be the people’s mode of choice, thus enabling unity and a national drive for sustainable economic growth’.

Within the Government Transformation Programme (GTP) (Source: Pemandu, 2010), the NKRA (National Key Result Area) for Urban Land Public Transport set a number of goals up to 2012:

- Raise modal share
- Improve reliability and journey times
- Enhance comfort and convenience
- Improve accessibility and connectivity

SPAD owns part of the Urban Public Transport NKRA and was set up to consolidate selected land public transport related portfolios from other agencies and develop the NLPTMP. SPAD’s Mission for land public transport in Malaysia can be summarised as:

‘To achieve a safe, reliable, efficient, responsive, accessible, planned, integrated, affordable and sustainable land public transport system to enhance socio-economic development and quality of life.’

The NLPTMP outlines the National Land Public Transport Policy and includes Planning Guidelines which provides the guidance on the methodology for setting objectives, development proposals, policy measures and assessments of solutions. The Planning Guidelines will be instrumental in facilitating development of Regional Land Public Transport Master Plans (Regional Master Plan) and further enabling the interface with State-specific planning documents and its land use policies. The overarching policies set out by SPAD are to:

- Undertake comprehensive and integrated planning
- Strengthen institutions
- Reform regulation and market structures
- Optimise existing assets
- Drive new investment in land public transport
This document provides the first Regional Master Plan developed by SPAD for the Greater Kuala Lumpur/Klang Valley Region, the Greater Kuala Lumpur/Klang Valley Land Public Transport Master Plan.

The definition of the Greater Kuala Lumpur/Klang Valley Region is taken from the Economic Transformation Programme (ETP) (Source: Pemandu, 2010). The region comprises Kuala Lumpur, Putrajaya and all districts in Selangor with the exception of Kuala Langat, Kuala Selangor, Sabak Bernam and Hulu Selangor (See Figure 1.1). The region is defined as being of key economic importance for Malaysia as a whole. Over 37% of the Nation’s GDP is identified as being related to Kuala Lumpur and Selangor (Source: National Statistics 2009). Within the ETP, the NKEA (National Key Economic Area) for the Greater KL/Klang Valley Region has specified the following objectives:

‘To achieve a top-20 ranking in city economic growth while being among the global top-20 most liveable cities by 2020 via 9 entry point projects (EPP)’.

One element of the Key EPP is the Greater Kuala Lumpur/Klang Valley Connect which is about land public transport within the urban city. In defining the region for the Master Plan, analysis of travel demand data indicates that areas such as Nilai and Seremban, whilst being outside the defined region, do contribute significant demands to Kuala Lumpur and should therefore be considered in developing the land public transport strategy.

At present, land public transport mode share in Greater Kuala Lumpur/Klang Valley stands at 16% for morning peak. This is relatively low compared to other major cities and has fallen since the 1980s. This decline is in spite of increased population and households in the region. The fall in land public transport share reflects the increase of the highway network supply; changes in household characteristics such as reducing household sizes; rise in household incomes; affordability of cars; the poor accessibility and service reliability of public transport.

The key concerns for each mode of public transport include:

- **Rail** - the capacity of the system and its availability, and the quality of KTM.
- **Bus** - the quality of provision is poor with network coverage and availability leaving large gaps in the network, unreliability of services, their punctuality and the associated waiting times while for operators the viability of services is a challenge. There is currently a general lack of coordinated planning in the provision of bus services. This lack of planning is
borne out by the needs of commercial operators to increase revenues and this therefore results in heavy concentration of bus services on key radial routes
  • Taxi - the issues relate to quality issues such as the standards of vehicles and drivers

Looking to the future, as population and employment within the region grows so will the demand for transport. To this effect the public transport network coverage will have to increase in tandem to encourage modal switch. To this effect it is critical that the Master Plan takes into consideration existing land use plans and projected travel demand patterns of commuters between employment, residential and leisure conurbations to deliver an optimal public transport network for the region.

Objectives

The objectives of the Greater Kuala Lumpur/Klang Valley Master Plan are:
  • To identify a single, consolidated and supported land public transport strategy for the Greater Kuala Lumpur/Klang Valley Region
  • To integrate all land public transport modes (i.e. bus, rail and taxi) to provide users with a seamless journey of high quality
  • Be guided by logical, pragmatic and sustainable principles in its planning to address current needs, which support future expectations

Guiding Principles

In order to aid the development of the Greater Kuala Lumpur Klang Valley Master Plan, a series of Guiding Principles have been developed as listed below:
  • Consider the planning, integration and co-ordination of all land public transport modes
  • Define modal share targets
  • Define complementary policies to allow the land public transport modal share to achieve the targets
  • Allow land public transport to be socially inclusive to be the mode of choice for all users
  • Provide for increased accessibility and connectivity
  • Take account of the hierarchy of centres; primary centres in particular should be served by rail, where possible to encourage modal transfer
  • Provide capacity to meet future demands efficiently and reliably to allow the region to grow economically
  • Provide additional capacity to serve central Kuala Lumpur given its economic importance to the country
  • Be based on a process of engagement with Stakeholders
  • Take account of previous studies and plans where appropriate
  • Seek to provide environmental benefits to the region in terms of noise and air quality
  • Corridors should be served according to the appropriate mode to meet demands

National Land Public Transport Master Plan Guidance: Developing Regional Master Plans

The development of Regional Master Plans follows the planning guidance set out within the NLPTMP. The adoption of the planning process within the Planning Guidelines provides an approach with three broad thrusts to understand current and future conditions within a region, explore and assess strategic land public transport options for a region and confirm and plan the overall Regional Master Plan (see Figure 1.2). To support Regional Master Plan development, a series of transport analysis tools have been developed including a multi-modal transport model, and GIS accessibility tools to support the decisions made for the plan. Regional Master Plans are produced with the on-going engagement of stakeholders to identify key issues and concerns and ensure the initiatives presented are focussed and deliverable.
Executive Summary

The Planning Guidelines sets-out the following:

- The land public transport national vision and objectives
- Definition of the target mode share for the region
- Definition of transport corridors based on a hierarchy including primary, secondary, local and feeder corridors
- Identification of the travel demands in the corridors in terms of PPHPD and select the appropriate modes for future provision in those corridors
- Assessment of alternative land public transport measures and their consolidation into the overall plan
- Selection of appropriate funding and delivery mechanisms

Using the Guiding Principles of the National Land Public Transport Policy and the Planning Guidelines, the process of developing the Regional Master Plan follows a series of stages which seek to understand the existing situation through the collation of existing data sources, the collection of new travel data and stakeholder engagement (see Figure 1.2). A suite of transport analysis tools is established which includes a transport model, GIS land use database and an accessibility model. These are used to forecast future transport conditions given known land use proposals and committed transport schemes. From this basis the concepts in the National Guidelines can be adopted including:

- Definition of the target mode share for the region
- Definition of transport corridors based on a hierarchy including primary, secondary, local and feeder corridors
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Figure 1.2: Master Plan Development Process

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- Assessment of the travel demands in the corridors using the PPHPD and select the appropriate modes for future provision in those corridors.

Figure 1.3: Master Plan Development Process

From this basis the policies and measures can be selected through the following approach:

- Fix - identify current operational issues and seek to address these (such as regulation, fares structure, monitoring integration)
- Improve - upgrade operations and infrastructure to appropriate standards
- Attract - provide investment in the corridors through new capacity (for example new rail lines) and infrastructure
- Push - define complementary policy measures through land use and travel demand management allow the public transport modal share to achieve the targets

The Regional Master Plan is an assembly of the policy instruments, proposals and transformation plans for public transport in a region. Key to the success of the Regional Master Plan is the dire need for integration of public transport modes and the assessment of benefits.
The Greater Kuala Lumpur/Klang Valley Master Plan Structure

The Greater Kuala Lumpur/Klang Valley Master Plan sets out an integrated 20 years plan to transform land public transport in the region responding to local needs and aspirations and providing consistency with the DBKL City Plan, the Structure and Local Plans within Selangor and the Putrajaya Plan. The NKRA had previously researched land public transport issues in the region and developed an initial set of initiatives to improve land public transport in the Greater Kuala Lumpur/Klang Valley Region. The Greater Kuala Lumpur/Klang Valley Master Plan builds on these to provide a 20 years plan to aid the aspiration for a World Class City.

The Greater KL/Klang Valley Master Plan is an assembly of the policy instruments, modal proposals and transformation plans with a delivery plan for implementation, funding sources and outlines the requirements for performance monitoring. The Greater Kuala Lumpur/Klang Valley Master Plan is supported by detailed six Subsidiary Plans.

The Urban Rail Development Plan (URDP) sets basis for the development of urban rail services and future corridors in the Greater Kuala Lumpur/Klang Valley region.

The Bus Transformation Plan (BTP) and Taxi Transformation Plan (TTP) identify the service standards and industry requirements for improvements to these modes. The Interchange & Integration Plan (IIP) demonstrates the methods that can be adopted to link the modes develop the first and last mile and reduce the barriers of using land public transport. Finally the Land Use Plan (LUP) and Travel Demand Management Plan (TDMP) identify those supporting measures to assist the development of land public transport in the region. Together these provide an integrated land public transport plan for the Greater Kuala Lumpur/Klang Valley Region and are summarised in the overall Greater KL/Klang Valley Master Plan document.

Figure 1.4: Linkages to the Greater KL/Klang Valley Master Plan
Delivering a World Class Public Transport System for the Greater Kuala Lumpur/Klang Valley Region

Population will continue to grow in the region increasing the demand to travel. Employment intensification is proposed in key centres, particularly the centre of Kuala Lumpur. The employment areas will need good accessibility to maintain the economic status of the region.

The increase in population and employment will increase travel demands. This will put further pressure on the highway network with resulting congestion and unreliable journey times unless public transport capacity and performance improves so as to reduce traffic levels. Land public transport accessibility will be improved along the committed rail and bus network extensions but overall accessibility will worsen unless additional land public transport supply is provided.

The Master Plan has set out definitions for developing the hierarchies of transport corridors based on primary, secondary, feeder and local/district. The assessment process considers the role of each mode such that the growing travel demand can be met by the appropriate mode.

The range of primary and secondary corridors has been defined for the Greater Kuala Lumpur/Klang Valley Region. The primary corridors focus on the access to the city centre of Kuala Lumpur while secondary corridors focus on orbital movements and the other centres. The volumes of demand in the primary corridors in Greater Kuala Lumpur/Klang Valley justify the provision of high capacity rail services.

The Master Plan includes a series of strategies and initiatives to transform the quality of land public transport in the region:

• For rail, initiatives have been developed which seek to maximise the use of the existing KTM network while providing additional capacity in primary and secondary corridors as necessary through the inclusion of new lines and extensions of existing facilities. A phasing strategy has been derived which best serves the needs of the region by identifying those elements for completion by 2020 and 2030.

• For bus, initiatives have been developed, which seeks to deliver an improved network of services; within a regulatory regime which will work for users, operators and public sector entities. The transformation will deliver the standards that the users currently seek; an open and transparent operating environment for operators, as well as contributing to the objectives and policies developed by the government. However, in order to achieve these standards there will be a need for a change in the regulatory regime away from an open market or quality licensing system. In accordance with international best practice, a comprehensive tendering regime based on contracts will secure the services necessary to meet the Plan’s objectives and raise standards.

• For taxi, a number of regulatory changes are required in order to improve the operation of the taxi market. These include improvements in vehicle and driver quality that must be delivered and the enforcement of standards and regulations must be a priority.

At present the provision of interchange between land public transport modes is considered dissatisfactory. No seamless transfer is possible due to physical and ticketing constraints. It is not possible to interchange between rail networks in the Klang Valley without having to first leave the ticket barriers of each individual station. To this effect, the IIP seeks to offer guidance on introducing seamless ticketing measures, which will improve the travel experience for commuters.

An additional, focus of the IIP is the multi-modal interchange between one mode of public transport and another land public transport mode at terminals. It also considers the interchange between public transport and its ‘feeder’ modes for example walking, motorcycle and private car vehicles to encourage better connectivity of the first and last mile. Further, the Master Plan proposes additional interchange stations within the urban rail network, both between the new lines and the existing lines. This will not only result in more convenient land public transport services for passengers but also ensure that land public transport network is more operationally efficient, bolstering the economic functions of the region.
The Master Plan is supported by measures to enhance land public transport mode share with land use policy initiatives and Travel Demand Management. Pertaining to the former, the Master Plan seeks to improve accessibility to land public transport through integrating with local land use policies, with a key focus on transit orientated developments. Pertaining to the latter, the Master Plan suggests push and pull travel demand management measures to further encourage modal shift in aim of realising and sustaining modal share targets.

Given the comprehensive strategies set-out in the Master Plan, it is anticipated that the land public transport network in the region will meet the travel demands of commuters and serve to expedite Malaysia’s wider national economic transformation aspirations.
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1 Background
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1.1 Introduction

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![Figure 1.1: Greater KL/Klang Valley Region](image)

1.3 Objectives

The objectives of the Greater Kuala Lumpur/Klang Valley Master Plan are:

- To identify a single, consolidated and supported land public transport strategy for the Greater Kuala Lumpur/Klang Valley Region
- To integrate all land public transport modes (i.e. bus, rail and taxi) to provide users with a seamless journey of high quality
- Be guided by logical, pragmatic and sustainable principles in its planning to address current needs, which support future expectations
1.4 Guiding Principles

In order to aid the development of the Greater Kuala Lumpur Klang Valley Master Plan, a series of Guiding Principles have been developed as listed below:

- Consider the planning, integration and co-ordination of all land public transport modes
- Define modal share targets
- Define complementary policies to allow the land public transport modal share to achieve the targets
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- Provide for increased accessibility and connectivity
- Take account of the hierarchy of centres; primary centres in particular should be served by rail, where possible to encourage modal transfer
- Provide capacity to meet future demands efficiently and reliably to allow the region to grow economically
- Provide additional capacity to serve central Kuala Lumpur given its economic importance to the country
- Be based on a process of engagement with Stakeholders
- Take account of previous studies and plans where appropriate
- Seek to provide environmental benefits to the region in terms of noise and air quality
- Corridors should be served according to the appropriate mode to meet demands

1.5 The National Land Public Transport Master Plan Guidance: The Process of Regional Master Plan Development

The development of Regional Master Plans follows the planning guidance set out within the NLPTMP. The adoption of the planning process within the Planning Guidelines provides an approach with three broad thrusts to understand current and future conditions within a region, explore and assess strategic land public transport options for a region and confirm and plan the overall Regional Master Plan (see Figure 1.2). To support Regional Master Plan development, a series of transport analysis tools have been developed including a multi-modal transport model, and GIS accessibility tools to support the decisions made for the plan. Regional Master Plans are produced with the on-going engagement of stakeholders to identify key issues and concerns and ensure the initiatives presented are focussed and deliverable.

Figure 1.2: Master Plan Development Process

Guidance from the Planning Guidelines aids:

- Provision of the land public transport national vision and objectives
- Definition of the target mode share for the region
- Definition of transport corridors based on a hierarchy including primary, secondary, local and feeder corridors
- Identification of the travel demands in the corridors in terms of PPHPD and select the appropriate modes for future provision in those corridors
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- Assessment of alternative land public transport measures and their consolidation into the overall plan
- Selection of appropriate funding and delivery mechanisms

Using the Guiding Principles of the National Land Public Transport Policy and the Planning Guidelines, the process of developing the Regional Master Plan follows a series of stages which seek to understand the existing situation through the collation of existing data sources,
The Regional Master Plan is then an assembly of the policy instruments, proposals and transformation plans for public transport in a region. Key to the success of the Regional Master Plan is the dire need for integration of public transport modes and the assessment of benefits. Often land public transport is only one part of the passenger journey. Integration with other modes (public transport, private transport, walking and cycling) is important to maximise the potential usage of land public transport. This can be referred to as the ‘first and last mile’.

The Greater Kuala Lumpur/Klang Valley Master Plan sets out an integrated 20 years plan to transform land public transport in the region responding to local needs and aspirations and providing consistency with the DBKL City Plan, the Structure and Local Plans within Selangor and the Putrajaya Plan. The NKRA had previously researched land public transport issues in the region and developed an initial set of initiatives to improve land public transport in the Greater Kuala Lumpur/Klang Valley Region. The Greater Kuala Lumpur/Klang Valley Master Plan builds on these to provide a 20 years plan to aid the aspiration for a World Class City.

The collection of new travel data and stakeholder engagement (see Figure 1.3). A suite of transport analysis tools is established which includes a transport model, GIS land use database and an accessibility model. These are used to forecast future transport conditions given known land use proposals and committed transport schemes. From this basis the concepts in the National Guidelines can be adopted including:

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- Fix - identify current operational issues and seek to address these (such as regulation, fares structure, monitoring integration)
- Improve - upgrade operations and infrastructure to appropriate standards
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The Greater Kuala Lumpur/Klang Valley Master Plan is an assembly of the policy instruments, modal proposals and transformation plans with a delivery plan for implementation, funding sources and outlines the requirements for performance monitoring. The Greater Kuala Lumpur/Klang Valley Master Plan is supported by detailed six Subsidiary Plans.

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1.6 Structure of the Greater Kuala Lumpur/Klang Valley Master Plan

This document provides a summary of the Master Plan for the Greater Kuala Lumpur/Klang Valley Region. The summary of contents (excluding this chapter) is shown in the table below:

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Key Conclusions

SPAD had developed the National Land Public Transport Master Plan (NLPTMP) to set out the vision and guiding principles for public transport in Malaysia.

The objective of the NLPTMP is to drive the development of the National Master Plan, which comprises of Regional Master Plans and Sector Plans.

The NLPTMP provides a Planning Guideline to guide the development of Regional Master Plans.

The first Regional Master Plan developed by SPAD is for the Greater Kuala Lumpur/Klang Valley Region, the Greater Kuala Lumpur/Klang Valley Master Plan.

The Greater Kuala Lumpur/Klang Valley Master Plan contains six subsidiary plans, URDP, BTP, TTP, LUP, IIP, and TDMP. Together these provide an integrated land public transport plan for the Greater Kuala Lumpur/Klang Valley Region.
Assessment of Current Conditions
2 Assessment of Current Conditions

2.1 Introduction

In developing the Greater Kuala Lumpur/Klang Valley Master Plan, a process of 9 stages is undertaken as outlined in Figure 1.3. The initial stage in developing the Master Plan has been to understand the existing conditions in the Greater Kuala Lumpur/Klang Valley based on the engagement with stakeholders, collation and analysis of available data, NKRA reports and new data collection. Having identified the existing situation, a review of the forecast travel situation in the region is identified. The key factors in the assessment are travel demands, including population (and employment), accessibility, travel pattern and travel time. Additionally, other considerations such as network, land use and known technical constraints are assessed (see Figure 2.1). Land use data is assembled from local authorities to reflect future population and employment changes identified in Structure and Local Plans. The assessment has examines the current regulatory regime and carried out an international benchmarking exercise to compare Kuala Lumpur with other cities.

The development process of Regional Master Plans ensures alignment of state-level public transport plans and the National Land Public Transport Policy, whilst placing importance on accommodating state-specific requirements. This is achieved through a collaboration process between state authorities and SPAD in developing the Regional Master Plans.

Additionally; the Regional Master Plans recognise the need for consistency between state plan directives and the necessity for public transport. Therefore the Regional Master Plan takes account of the location of major development areas which need to be served by public transport.

![Figure 2.1: Key Considerations in the Master Plan Assessment](image-url)
A series of transport analysis tools have been developed using available data source’s to replicate existing conditions and forecast future travel patterns resulting from the proposed land use. Alternative scenarios have been tested to identify the most appropriate policy measures and schemes for inclusion in the Master Plan by assessing their impact on mode share, land public transport ridership, travel times and accessibility.

2.2 Demographics
The 2010 census identified a regional population of 6.3 million in the Greater Kuala Lumpur/Klang Valley. There were an additional 1.7 million people living in the region compared to 2000. The largest growth has been to the south and west of Kuala Lumpur in districts such as Sepang, Petaling Jaya and Putrajaya. Recent trends have highlighted the increasing concentration of employment in the major centres which has implications for the choice of appropriate modes to serve these centres. More detail on the demographic characteristics of the region is included in the URDP.

2.3 Land Public Transport Supply
2.3.1 Rail
The current public transport network in the region includes over 278km of rail with 115 stations (see Figure 2.2 and Table 2.1). The KTM Komuter runs on rail corridors that are among the oldest in the country. In the early 1990s freight and passenger railway tracks between Port Klang, Sentul, Rawang and Seremban were upgraded and electrified and opened as the KTM Komuter system in 1995. Since then there have been extensions to Tanjung Malim, Batu Caves and from Seremban to Sungai Gadut. The current system is operated by Keretapi Tanah Melayu Berhad (KTMB).

The Ampang Line (formerly STAR) was built on grade separated tracks using a combination of new alignments and the utilisation of disused freight rail lines from Pudu to Ampang. The first phase of the system opened in December 1995 and became fully operational in December 1998. The Kelana Jaya line opened in 1998 as the Putra LRT using a completely new grade separated alignment. The Kuala Lumpur monorail opened in 2003 and links areas within the centre of Kuala Lumpur that were not served by the other urban rail systems. These three systems are currently operated by Rapid Kuala Lumpur.

<table>
<thead>
<tr>
<th>Rail Line</th>
<th>General Rail Category</th>
<th>Route Length</th>
<th>No. of stations</th>
<th>Peak Hour Headway</th>
<th>Current Daily Ridership</th>
</tr>
</thead>
<tbody>
<tr>
<td>KTMB Komuter</td>
<td>Suburban Rail</td>
<td>157 km</td>
<td>50 Stations</td>
<td>15 min</td>
<td>95,000</td>
</tr>
<tr>
<td>Kelana Jaya (Putra) LRT1</td>
<td>Urban Rail / Metro</td>
<td>29 km</td>
<td>24 Stations</td>
<td>3 min</td>
<td>140,000</td>
</tr>
<tr>
<td>Ampang (STAR) LRT2</td>
<td>Urban Rail / Metro</td>
<td>27 km</td>
<td>25 Stations</td>
<td>3-6 min</td>
<td>141,000</td>
</tr>
<tr>
<td>Monorail</td>
<td>Urban Rail / Metro</td>
<td>8.6 km</td>
<td>11 Stations</td>
<td>5 min</td>
<td>57,500</td>
</tr>
<tr>
<td>Klia</td>
<td>Suburban Rail/Airport Express</td>
<td>57 km</td>
<td>5 Stations</td>
<td>15 min</td>
<td>11,000</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>278.6 km</td>
<td>115 Stations</td>
<td></td>
<td>464,500</td>
</tr>
</tbody>
</table>

(Source: Prasarana, KTMB)

The main features of the rail system are:

- The current daily ridership is over 464,000 passengers per day with the Kelana Jaya and Ampang LRT services having the highest passenger loads
- The busiest stations include the main interchanges such as Masjid Jamek and Kuala Lumpur Sentral
- Typically KTM service is being used for longer distance movements including locations outside the Greater Kuala Lumpur/Klang Valley Region such as Seremban
- Of 50 KTM Komuter stations in the region, 12 have less than 250 passengers per day. This reflects the inaccessibility from the surrounding areas as well as the low frequency and slow journey times on KTM. This highlights a need to provide improvements to the KTM services
- KTM Komuter services encounter capacity constraints as they have to compete with freight movements through the city centre as well as constraints at junctions (such as for the Batu branch)
• LRT and Monorail services struggle to provide sufficient capacity under current operations

• A number of stations are poorly integrated with other modes

• The travel cards introduced by Rapid Kuala Lumpur are increasing the ticket integration between bus and LRT. This system will be extended to KTM as part of the NKRA

• There are gaps in the region where the local population has poor access to good public transport links

Figure 2.2: Existing Public Transport Network
(Source: Halcrow)
Rail capacity is struggling to meet current passenger demands and as a result initiatives were developed as part of the NKRA to increase the number of car sets for LRT1, Monorail and KTM Komuter. However, as will be identified in the next chapter, looking to the future this capacity will not be sufficient to serve the key centres and further enhancement is required.

### 2.3.2 Existing Bus Services

The current methods and standards of operation of bus services in the Greater Kuala Lumpur/Klang Valley region result in severe service quality, reliability and delivery issues. The existing delivery of services, perceived lack of integrated or comprehensive bus planning, unpublished timetables, uncoordinated services and distinct lack of enforcement of operating rules indicates that the services are failing to meet the needs of Greater Kuala Lumpur/Klang Valley and there is currently a general lack of effective regulation and enforcement in the bus industry. These issues require to be addressed through a new regime that matches improved service delivery with bus network planning that addresses land use changes, the relationship between bus services and the other public transport modes in the hierarchy and is controlled through an improved regulatory framework. This will ensure better integration in order to meet the needs of present users and ensure that services become attractive to a wider range of potential users.

There is an extensive bus network operated by Rapid Kuala Lumpur, Metrobus and a number of smaller operators. The salient features of the present bus service provision are as follows:

- The existing service pattern focuses on central Kuala Lumpur (see Figure 2.3) and is principally concentrated on the main corridors of movement where a high frequency level of service can be found. These tend to be radial routes emanating from Kuala Lumpur where operators are likely to experience high ridership and levels of revenues. However the physical structure of the highway network combined with the way services are actually operated means that service accessibility, availability and integration is limited. The lack of coordination or regulation means that oversupply often occurs and competition between operators is often duplicative rather than adding any new facilities to the network.

![Figure 2.3: Existing Bus Route Density](Source: Halcrow)

- At the outer end of journeys there is very little penetration of residential areas and the analysis indicates that very large numbers of people are not within a reasonable walking distance of a bus service. The NKRA identified that 63% of the population lived within 400 metres of a bus service. In many cases the residential area road connections to more major routes are poor in terms of efficient bus service operation. Moreover the service pattern does not mirror emerging land use patterns and ability to provide for good public transport penetration of emerging areas is generally not a factor considered at the allocation and land use planning stages. This situation is exacerbated in the lower density fringe areas of the conurbation. These areas are more difficult to serve effectively with bus services thus dependency on private motor vehicles or other forms of transport such as motorcycles is likely to be high.
• The large industrial areas within the region are poorly served by local bus services and are likely to be difficult to serve comprehensively owing to their layout - some employers continue to use contracted buses to move labour.

• There are a few of evidence that in zoning the location of new development the need for good public transport access is taken into account, nor is bus access and penetration taken into account in the layout of development. This approach to bus access and related facilities undermines future provision.

• Integration between modes and between bus services can be described as sporadic across the region. In the central areas, where existing rail services are provided, bus to rail integration and the connectivity it provides is achieved with relative success but this is much less evidence elsewhere.

• The daily ridership on Rapid Kuala Lumpur services is some 380,000 passengers per day.

• Bus services have little bus priority measures to protect them from congestion. The average bus speed in the morning peak ranges from 9 to 15 km/h. There are only 13 km of bus lane in the region which is very low compared to other cities.

• There is poor enforcement of existing bus lane facilities.

• There are some 4,200 bus stops in the region. This is generally a low number for an urban area of this nature. Many of the stops are poor in quality with limited information although the NKRA is starting an improvement programme in the city centre.

• There appears to be nothing in the legislation to prevent the advanced planning of a bus network for the region - indeed this is one of the duties of SPAD under the new legislation. However there are implementation and regulatory issues associated with the interpretation and application of regulations, service licensing, short term technical capacity at SPAD and financial support that prevent this from taking place or prevent it from being implemented effectively. Bus service implementation is not carried out according to a strategy and this result in an uneven distribution of bus resources and some competitive duplication of services by two or more operators.

2.3.3 Taxis in the Greater Kuala Lumpur/Klang Valley

The Taxi industry in Greater Kuala Lumpur/Klang Valley is split into two main sub classes; Executive and Budget. A third category, Premier, which sat between the Budget and Executive classes is currently being phased out due to the overlap with the Executive class and no new licences are being issued. Premier cabs are focused at the Kuala Lumpur Sentral Station, Budget taxis can be found across the area and Executive taxis are focused mainly in the city to cater for affluent visitors and business travellers. The core taxi market, Budget and Executive vehicles are the focus of the TTP.
A summary of the review for the TTP shows that:

- There are over 29,000 Budget taxis licensed for use in Greater Kuala Lumpur/Klang Valley and some 1,500 Executive taxis. It is clear that the Budget sector is the main taxi market across Greater Kuala Lumpur/Klang Valley with 95% of taxi licences and Executive with the remaining 5% of the market. In addition to the Budget and Executive taxis there are 531 Airport Taxis registered in Kuala Lumpur and 2,044 registered in Selangor.
- In addition there are 252 and 785 limousines registered in Kuala Lumpur and Selangor respectively with a further 1,055 and 449 Hired Cars registered in Kuala Lumpur and Selangor respectively.
- Compared to other international cities the provision of taxis in the Klang Valley compared to the population is on the high side.
- Both Budget and Executive taxis are permitted to be licensed up to 10 years of age. An analysis of the current age of the fleet shows that some 52% of the Budget fleet are aged between 5 and 8 years old. This indicates the fleet is aging and there is a risk that quality will further reduce over the next 2 - 3 years as the vehicles reach the end of their permitted licensing period.

2.4 Travel Demands

In recent decades the mode share of land public transport in the morning peak has fallen from 34% in the 1980’s to 10-12% in 2008 (Source: NKRA). This share is relatively low compared to other international cities such as Hong Kong (90% by land public transport), Singapore (63% by land public transport), and London (55% by land public transport). This reduction in Land Public Transport reflects the:

- Increase of the highway network supply
- Changes in household characteristics such as reducing household sizes
- Rise in household incomes
- Affordability of cars
- Poor quality of public transport
- Unreliability of buses.

The daily ridership on rail is estimated as 465,000 passengers per day with the majority on the two LRT lines. Information for the Rapid Kuala Lumpur services indicates daily ridership of 380,000 passengers per day. There are currently no data available on the number of taxi passengers per day.

Estimates for the NKRA suggest that the regional land public transport mode share is 12% (Source: Pemandu 2010). However, for movements to the city centre of Kuala Lumpur the proportion travelling by land public transport is much higher at over 30% due to the higher volumes of bus and rail demands.

2.5 Travel Times And Accessibility

The net result of increased car use has been a rise in congestion across the region. However door to door travel times for private vehicles remain competitive against the use of public transport. Travel times are typically much higher by public transport resulting in poorer accessibility to jobs and facilities. For example, Figure 2.4 compares the perceived door to door travel times (and include weighted elements of walking times at both the origin and destination, waiting time, in-vehicle time, and interchange time) to KLCC by car and public transport from all other areas in the region. Areas shown in blue have the lowest travel times while those in red have the longer travel times (the UDRP explains the derivation of these times). The figure shows that travel times by car are typically shorter than by land public transport for many journeys in the region. The exception is those corridors currently well served by rail such as the LRT corridors.
Accessibility by public transport is an important theme of the Master Plan. This has been mapped from both the perspectives of employers and residents across the region. Figure 2.5 shows the Accessibility Indicator from the employer’s perspective and indicates for any location, the number of employees within 75 minutes of those jobs by using land public transport. The blue areas on the maps are those areas with the greatest accessibility and where employers have a much larger pool of labour to attract within 75 minutes. The pink areas are those with much lower attractiveness as they have lower numbers of workers available within their catchment. The diagram has screened out those in white which do not have significant employment in them.

Figure 2.4: Modelled Perceived Travel times to KLCC
(Source: Greater Kuala Lumpur Transport Model)
Typically the more accessible areas by land public transport reflect the rail corridors within Kuala Lumpur. Within the central area of Kuala Lumpur there is a strong focus on the LRT corridors. The map does show that areas to the north and west of the region generally have less accessibility than to the south. Therefore for land public transport; only those employers close to a rail or LRT line have good access to the workforce and similarly those residents living close to such lines have greater access to employment by land public transport.

Figure 2.5: Accessibility- Number of Employees within a 75 minute catchment-2010

2.6 Service Reliability And Efficiency

Maximising the reliability of existing systems can help enhance both their attractiveness and increase capacity. Each train or bus cancelled or delayed will undermine the attraction of the service and reduce capacity. Indeed often it is the uncertainty of unreliable services that deters users more than the actual frequency or journey time. Similarly, poor efficiency will be likely to result in poorer overall service quality (and potentially volume), the need for higher fares than necessary as well as worse financial results.

It has not been possible to establish clear benchmarks of existing performance of the land public transport operators, but one focus of the Master Plan must be to ensure that all operators are providing as efficient and reliable services as reasonably practicable. In the absence of monitoring and benchmarking information it is impossible to judge whether the operators are providing the best possible services at the best value. The lack of robust monitoring also makes it difficult to put complaints into context.

The conclusion is that a system of robust monitoring, benchmarking and reporting needs to be put into place for all land public transport operations. Should this identify weaknesses (including the use of reasonable comparator systems) then action plans need to be developed to address these weaknesses and to ensure that they are not replicated in the design and planned operation of system enhancements, extensions and new lines.

2.7 Stakeholder Engagement

As part of the ongoing study, stakeholder engagement with key agencies was used to inform the development of the Master Plan. The initial engagement included federal agencies, Dewan Bandaraya Kuala Lumpur (DBKL), Selangor State Unit Perancang Ekonomi Negeri (UPEN), Perbadanan Putrajaya, other district local authorities, and transport operators. From this process SPAD has:

- Identified key concerns and issues
- Identified stakeholder’s plans and proposals for the future
- Collated a range of data (land use information, rail patronage, bus network data, traffic counts and journey time data)

The key view points on land public transport from stakeholders on each mode are set out in Figure 2.6. For rail, the main industry concerns highlighted issues in relation to the capacity and quality of the existing system, integration between modes particularly the feeder services and gaps in network coverage. From the bus industry the concerns covered issues related to competition between the different types of operator. Alongside issues of congestion the main bus industry concern was the profitability of operations. From the taxi industry the concerns were less on the profitability of the industry and more related to standards of service including congestion, road maintenance, driver training and vehicle types.
Therefore in assessing the timing of improvements there is a view that there are a number of problems to be resolved now in terms of the quality of the land public transport system in the region.

The integration of land use planning and the Master Plan was raised by DBKL and UPEN with the need to ensure consistency between the plans as a means of matching public transport proposals with Transit Oriented Developments (TODs). Therefore, the strategy development process needs to ensure consistency between the Master Plan and City and Structure Plans. The provision of corridors identified by the Master Plan needs to match the development aspirations of the local authorities in order to maximise the potential for land public transport use.

### 2.8 Public Perceptions

Public feedback on land public transport services has been obtained through the latest Pemandu Q3 2010 NKRA Baseline Survey. This assessed public transport users' satisfaction levels with the service they received. Figure 2.7 shows that the most satisfied users are those of LRT followed by Taxi users. The least satisfied users are those of the KTM Komuter services. It is recognised that these figures only represent service users and in order to understand satisfaction levels across the wider population it is important to undertake wider reaching public attitude surveys with both service users and non-users. It is likely that a satisfaction measurement which includes non-users will therefore be lower meaning that overall satisfaction levels are likely below the current levels quoted.

<table>
<thead>
<tr>
<th>Rail</th>
<th>Bus</th>
<th>Taxi</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Rail capacity of existing lines is somewhat limited</td>
<td>- Existing regulatory regime is not conducive for an effective network</td>
<td>- Road condition and traffic congestion affecting the taxi operators</td>
</tr>
<tr>
<td>- Conflicts between passenger and freight movements</td>
<td>- Operators complain about unfair competition practices</td>
<td>- Inefficient operation - only 30-40% of km travelled are chargeable (Singapore 70%, HK 80%)</td>
</tr>
<tr>
<td>- Track capacity constraints and poor signalling at junctions</td>
<td>- Insufficient fare box revenue prevent re-investment in new fleet</td>
<td>- Standards of service delivery need to be improved</td>
</tr>
<tr>
<td>- Poor integration with feeder modes</td>
<td>- Standards of service delivery need to be improved</td>
<td></td>
</tr>
</tbody>
</table>

Insufficient network coverage and poor integration

Regulatory framework and service standards need to be improved

Regulatory framework and service standards need to be improved

*Figure 2.6: Key Viewpoints from Stakeholders*
The issues identified by the users are shown in Figure 2.8. For rail the key issues relate to the availability of the KTM service, its capacity and integration with other modes. KTM Komuter services are relatively infrequent compared to other international heavy rail commuter services. For bus services there are concerns about the punctuality, waiting and travel time which in part reflects the levels of congestion in the city and the lack of priority measures. However, access to the bus system was also identified. For taxi users the key concerns relate to the availability of the service and quality issues such as safety, the condition of the vehicle, the use of the meter and the willingness of the driver to go the destination.

Figure 2.7: Public Transport Users Satisfaction Levels, (Source: Pemandu Q3 2010)

<table>
<thead>
<tr>
<th>Rail</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Service availability</td>
</tr>
<tr>
<td>- Service capacity</td>
</tr>
<tr>
<td>- Poor integration with bus feeder services</td>
</tr>
<tr>
<td>- Quality of existing track &amp; signaling</td>
</tr>
<tr>
<td>- Ticketing integration</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bus</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Punctuality</td>
</tr>
<tr>
<td>- Waiting and travel time</td>
</tr>
<tr>
<td>- Accessibility</td>
</tr>
<tr>
<td>- Bus condition</td>
</tr>
<tr>
<td>- Interchange</td>
</tr>
<tr>
<td>- Bus driver attitude</td>
</tr>
<tr>
<td>- Information</td>
</tr>
<tr>
<td>- Bus service</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Taxi</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Service availability</td>
</tr>
<tr>
<td>- Users safety</td>
</tr>
<tr>
<td>- Drivers attitude</td>
</tr>
<tr>
<td>- Call service</td>
</tr>
<tr>
<td>- Taxi condition</td>
</tr>
<tr>
<td>- Willingness to go to destination</td>
</tr>
<tr>
<td>- Charging according to the metre</td>
</tr>
</tbody>
</table>

Figure 2.8: Public Transport Use, key issues (Source: Pemandu Q3 2010)
Key Conclusions

The region has seen steady population growth in recent decades which has led to increasing demand for travel.

Land public transport mode share in Greater Kuala Lumpur is relatively low compared to other major cities.

The NKRA identified the current Mode Share is 12% by land public transport in the region as a whole for the morning peak.

The key concerns for rail are the capacity of the system, its availability and integration with other modes.

The key issues for bus are the unreliability of services, their punctuality and the associated waiting times.

The key issues for taxi relate to quality issues such as the standards of vehicles,

There are many areas where land public transport journey times to key destinations are unattractive.

Journey times by private vehicle tend to be faster than the equivalent journey by land public transport.

Accessibility to jobs by private transport is currently much greater than by land public transport resulting in low land public transport mode share.

Robust performance monitoring, benchmarking and reporting should be introduced urgently for all rail operators with action plans developed to address and weaknesses identified.

The issues identified demonstrate that there is a need for short term actions to improve the quality of land public transport in the region.
3 Looking to the Future
3 Looking to the Future

3.1 Introduction

The development of the Master Plan not only needs to provide measures to improve the quality and quantity of the existing land public transport network, but also future conditions. A series of time horizons have been assessed for the Master Plan to identify what future conditions will be like, particularly in relation to network capacity, travel demands, accessibility and the resulting travel times. This serves as a reference against which new schemes and policy measures can be assessed to identify the benefits these provide. Alternative 2020 and 2030 time horizons have been produced that take into account those schemes which are funded and committed, including:

- Ampang Line - extension from Sri Petaling to Putra Heights
- Kelana Jaya Line - extension from Kelana Jaya to Putra Heights
- NKRA initiatives for Keretapi Tanah Melayu Berhad (KTMB) - upgrade to 15 minutes service per branch
- NKRA initiatives related to LRT and Monorail with the provision of additional capacity through new train sets
- Other NKRA initiatives related to bus
- Planned highway schemes in the region

3.2 Transport Analysis Tools

The transport analysis tools have been developed for use by SPAD in assessing the key considerations of land use and transport schemes on future travel demands, travel times and accessibility.

The tools include:

- Land Use database which utilises the data provided by DBKL, Selangor UPEN and Perbadanan Putrajaya and local district plans
- Trip generation model which uses the land use information to derive the forecast travel demands
- Multi-modal transport model which derives future travel patterns on the network in terms of flows, and travel times- taking into account behavioural responses related to changing mode, changing destination or the frequency of journeys
- Accessibility model which shows the impact of travel times on access to locations within the study area for catchment area analysis
3.3 Identifying The Land Public Transport Gaps

Currently, the NKRA identified that 63% of population live within 400 metres of a bus service. There are short term NKRA measures to improve this (to 70%) but in the longer term the URDP showed that there are rail transit gaps (or white areas where rail is not easily accessible to the commuters) based on the proposed future rail network including MRT1 and the LRT extensions. Within Kuala Lumpur these include a number of suburbs such as Pandan, Mont Kiara, and Serdang which fall within rail gaps while in Selangor the rail network gaps include Cyberjaya, areas to the north and south of Klang and Shah Alam, and Selayang. Much of Putrajaya currently lies within a rail gap as the services operate to Putrajaya Sentral which is to the west of the city.

Given the importance of the region to the national economy, there is a need to increase accessibility to the primary centres and key employment areas. These include the centre of Kuala Lumpur where employment intensification is a key feature of the DBKL City Plan. Other centres such as Shah Alam and Putrajaya are also higher density employment locations. These will rely on the provision of enhanced public transport to serve these centres, both from radial and orbital perspectives. While there is an extensive bus network in place, there are still gaps without high quality reliable public transport links and from which journey times are slow. The gaps also indicate the need to improve modal integration for passengers to be able to use bus and rail services to access key centres.

3.4 Future Land Use Demand

The latest versions of the state and city plans have been reviewed to identify their data, land use policies and development proposals. The recommendations of the Master Plan are developed to allow consistency and integration with the development aspirations of the land use plans. The differences between the base year and future land use maps are shown in Figure 3.1. These show areas of significant intensification.

The land use plans seek to accommodate future population and employment growth to maintain the economic status of the region. The characteristics of the land use changes show:

- Urban expansion eastwards and northwards
- Greater intensification in key centres such as Kuala Lumpur city centre
- Major redevelopment sites identified in discussion with DBKL and UPEN. There are a number of major commercial developments within the land use plans which need to be integrated into the Public Transport Master Plan (such as Tun Razak Exchange (TRX) and Matrade). The growth in these locations will intensify the need for high capacity public transport for their own success and to maintain the economic status of the region. In particular, enhanced rail systems need to provide access to the centre of Kuala Lumpur
- The population forecasts assume a capacity of 10 million people in the region with the largest growth forecast in Klang, Sepang and Putrajaya. This is a 59% increase in population compared to 2010
- The draft DBKL City Plan forecasts the growth in jobs from 729,000 in 2005 to 1.2 million in 2010 and 1.4 million in 2020. The City Plan shows greater intensification particularly in the city centre

The growth in population and employment will maintain the pressure on the transport networks with increased demand for movement across the region. There is a need to provide better land public transport services to serve key future developments identified by the local authorities. Generating the intensity of demand within these gaps to justify rail investment would be greatly helped through TODs. These developments will provide a greater incentive for public transport use by their co-location to transit nodes.
3.5 Future Travel Demands

The travel demand models have been used to develop forecasts for a number of future years. The forecast morning peak hour travel demands by all modes (private and public transport) in the region show large radial movements towards the Central area of Kuala Lumpur (see Figure 3.2). Demand for all modes crossing the MRR1 as forecast for 2020 shows strong flows in all the corridors with the highest demands being from the Petaling Jaya/ Shah Alam/ Klang corridor.

Within the region there are also strong orbital demands in the suburban areas (see Figure 3.3), particularly to areas such as Petaling Jaya and Shah Alam. The largest flows are in the Petaling Jaya area along corridors such as the North-South Expressway and the Damansara-Puchong Expressway (LDP) corridor. In addition to these flows between centres, there is a wide diversity of local movements within the suburban areas such as local movements within Shah Alam or Klang. Although lower than the radial demands into the centre of Kuala Lumpur, these demands require high quality land public transport access.
Figure 3.2: Forecast Travel Demands towards Kuala Lumpur Central Area (Morning Peak Hour)

Figure 3.3: Forecast Travel Demands Orbital Movements (Morning Peak Hour)
Without improved land public transport and a mode shift to land public transport, the net result of the growth in travel demands arising from the land use changes will be further increased car usage. This will lead to longer travel times with a further significant rise in congestion for private vehicles, as well as buses leading to unreliable journeys. The forecast 2020 travel times to the centre of Kuala Lumpur clearly show the lengthening of private vehicle journey times with more areas in red (see Figure 3.4) and much fewer areas of blue. This will affect the commercial performance of the region.

Figure 3.4: Modelled Perceived Travel Times by Private Vehicle to KLCC  
(Source: Greater Kuala Lumpur Transport Model)
Key Conclusions

The increase in population and employment will increase travel demands.

This will put further pressure on the highway network with resulting congestion and unreliable journey times.

Land public transport accessibility is improved along the LRT extension corridors and the MRT extension, but significant areas remain without good accessibility.

Overall Accessibility will worsen unless additional land public transport supply is provided.

There is a need to improve the supply and quality of land public transport in the future to encourage modal transfer.

Mapping overall accessibility to employment by land public transport shows a much wider area of blue with improved accessibility as a result of the LRT extensions and MRT1 (see Figure 3.5). The areas of improvement follow these lines through areas such as Damansara, Cheras and Kajang. However the figure does confirm that significant gaps remain such as Mont Kiara and along the Klang Valley and that the committed schemes alone do not provide high quality land public transport services to all parts of the region. The conclusion is that further measures are needed including:

- Increased network coverage for bus and rail services
- Increased capacity of bus and rail services
- Improved integration between modes to reduce the ‘barriers’ of using land public transport
- Improved quality of Land Public Transport to encourage private vehicle users to make journeys by Land Public Transport
- Improved information provision about Land Public Transport to encourage its use

![Figure 3.5: Modelled Accessibility Index 2030](Source: Greater Kuala Lumpur Transport Model)
4 Developing the Plan
4 Developing the Plan

4.1 Introduction
The previous chapters have outlined the challenges to increasing land public transport use in the short and long term. In the short term there are immediate needs to improve accessibility, the quality and quantity of land public transport services. In the medium to long term the increase of population and employment in the region will increase travel demands significantly such that new land public transport services are needed to accommodate the growth, encourage modal transfer and move people efficiently. Failure to do so will lead to increased congestion on the highway network if current mode shares are maintained. The development of the Master Plan not only needs to provide measures to improve the quality and quantity of the existing public transport network, but also future conditions and take account of the NKEA aspiration of:

‘To achieve a top-20 ranking in city economic growth while being among the global top-20 most liveable cities by 2020 via 9 entry point projects (EPP)’.

In order to assess the potential approaches that should be adopted, reference has been made to the Planning Guidelines. This includes setting the objectives, identifying the appropriate modes, the corridor hierarchy and targets for aspects such as mode share and accessibility. The resulting plan identifies the measures, their implementation, and delivery across the short to long term horizons.

4.2 Objectives
The National Land Public Transport Master Plan sets out the key objectives for land public transport as identified in Figure 4.1. For each objective, a series of sub-objectives can be considered as identified in the figure below. These sub-objectives will permit indicators to be developed against which measurements can be identified and the performance of the plan assessed.

<table>
<thead>
<tr>
<th>NATIONAL OBJECTIVES FOR LPT</th>
</tr>
</thead>
</table>
| **Increase Economic Competitiveness and Growth** | - Access to jobs  
- Access to International Links & key employment centres  
- Reduced Journey times  
- Capacity |
| **Health, Safety & Security** | - Personal Security  
- Reduce Road Accidents  
- Encourage healthy lifestyle |
| **Improve Access, Connectivity & Integration** | - Access to PT Network  
- Access to facilities  
- Interchange  
- Quality of Journey  
- Integration with Land Use |
| **Efficiency & Affordability** | - Reliability  
- Encourage Modal Shift to PT  
- Cost, value for money & fundability  
- Feasibility studies  
- Deliverability |
| **Equality of Opportunity** | - Access for all  
- Affordable Pricing |
| **Environment** | - Impact on local Environment  
- Air Quality  
- Impact on Climate Change |

*Figure 4.1: Land Public Transport Objectives for Greater Kuala Lumpur/Klang Valley*
4.3 Corridor Hierarchy

A corridor hierarchy has been developed for the region with four levels identified including primary, secondary, feeder and local/ district corridors. These are distinguished within a functional hierarchy and are based on potential demand or PPHPD (see Figure 4.2). At the top level of the hierarchy are the primary corridors which are identified as those with the highest demand (over 25,000 PPHPD). Typically these will be linkages to city centres from other suburban centres. At these levels of demand, high quality rail-based systems are likely to be justified. Transit stops along the primary corridors will be further apart than on other corridors reflecting the need to serve the city centre. Each transit stop would be served by a walking catchment (potentially up to 400 metres if outdoors and over 400 metres if indoors or under cover). Transit stops would also be supported by a feeder bus network.

Secondary corridors serve a range of functions such as lower demand corridors to a city centre or as providing linkages to a primary corridor. They will have demands in the range 5,000 to 25,000 PPHPD. In these corridors demand will, in some cases, be sufficient to justify rail-based systems while in others a high quality bus solution may be more appropriate. Transit stops might be closer together on the secondary corridors served and walking and bus catchments.

Feeder services are crucial to support the primary and secondary corridors as these provide access to the main services. Finally there are local corridors which access other local centres as these will generate demands in their own right. Feeder services and local corridors are likely to be bus based, with the maximum practicable priority to minimise journey times and unreliability. The role of bus in the Greater Kuala Lumpur/Klang Valley Region is outlined in more detail in the BTP document.

Figure 4.2: Conceptual Corridor Hierarchy
4.4 Modes

Within the National Land Public Transport Master Plan, there is guidance on the appropriate mode for different levels of demand. Figure 4.3 shows the modal diagram as developed for the Greater Kuala Lumpur/Klang Valley Master Plan. This shows that land public transport covers a wide range of modes from different types of bus and rail systems. Each has different key characteristics in terms of PPHPD, average speed, technology and operating considerations.

- Buses typically operate at lower speeds and are more likely to be subjected to congestion thus impacting on their reliability and ability to operate to timetable. There is often the potential to implement priority measures and buses have the greatest flexibility to respond to changes in demand and network characteristics. They provide a much lower capacity compared to rail systems but do operate with lower costs where lower capacity is required.

- BRT systems can operate with a range of vehicle types from single deck buses carrying 70 passengers up to articulated vehicles carrying 300 passengers of which the majority will be standing. These rely more on segregated sections of carriageway in order to provide relief from congestion. The capacity provided is a function of the headway and vehicle types. This will determine the amount of carriageway required for BRT services. High frequency services, such as in Latin America, typically require more running lanes so that with transit stations, they can require the equivalent of a 5 lane highway and are thus very demanding of infrastructure needs.

- Street trams by comparison can operate within traffic lanes or segregated from traffic and are extensively used in Western Europe. Where they operate with traffic and pedestrians the speed is lower and can be subject to delay. In developing a network, as the system is at grade, there may be significant disruption to utilities during construction to avoid operational disruption. The capacity of

![Figure 4.3: Relating the Modes to Conceptual Corridor Hierarchy](image_url)

Note:
* The distances shown are indicative and set in the context of the Greater KL / KV
* The actual distances may vary by corridor and be dependent on the local circumstances including (but not limited to topography, engineering, demands and scheme costs.)
tram systems is not as large as for a monorail due to operational characteristics but the infrastructure costs are lower.

- Monorail also provides an overlap between local feeder and secondary corridors. These systems can provide similar levels of capacity to BRT and are segregated from traffic using elevated sections. They require sophisticated signal and control systems to operate at high frequency. Monorail systems have limited interoperability and it is not easy to switch tracks as with conventional rail systems.

- Rail systems can be envisaged as providing linkages to the city centre, particularly through primary and secondary corridors in Greater Kuala Lumpur/Klang Valley. They offer advantages in that they are the main mode most likely to encourage modal transfer from private vehicles. They also allow local authorities to encourage TODs in the corridor. Therefore primary corridors are characterised as being most appropriate for heavy rail, MRT and LRT systems. MRT will operate with a higher capacity than LRT systems but will be the most expensive to implement. LRT can provide lower capacity and cost services including providing access to secondary centres. Where elevated sections are provided these can have a relatively high visual impact. In many major cities rail is seen as the primary mode for high capacity corridors, particularly for city centres.

In developing a Master Plan, the role of each of the modes needs careful consideration according to the local requirements.

4.5 The Greater Kuala Lumpur/KV Corridor Hierarchy

Figures 4.4 and 4.5 shows the Primary and Secondary Corridors respectively as identified by their role in the hierarchy and the forecast levels of demand as outlined in the URDP. The Primary Corridors cover each of the main entries into the city centre of Kuala Lumpur with rail often providing the main mode.

- The KTM network provides services from the Klang, Sungai Buloh/Rawang corridors and for part of the Selayang corridor from Batu Caves
- LRT1 provides the main mode in the Gombak corridor
- LRT2 serves the Selayang and Ampang corridors
- Both LRT lines serve the Subang/Puchong corridor through their extensions to Putra Heights. This fills one of the current rail gaps
- The southern corridor towards Putrajaya is served by KTM and ERL
- The new MRT1 line will provide the main mode in the corridor from the CPA to Kota Damansara and Kajang (via Cheras) as well as linking Kota Damansara to Sungai Buloh. The MRT1 line therefore closes some of the key gaps in the existing rail network

Secondary corridors comprise the linkages to other centres such as Klang, Shah Alam, Petaling Jaya and Putrajaya and a number of orbital movements around Kuala Lumpur. There is an inner orbital corridor around the city linking locations such as Mont Kiara, Mid Valley Megamall and Sentul. An outer corridor can be identified linking Gombak, Selayang, Kota Damansara and Pandan. The demands in these corridors often reflect the road system with the LDP corridor and North-South (N-S) Expressway corridors having high demands. Looking at the future land public transport network the demands in these corridors would be served by modes appropriate to the local circumstances. In addition to the primary and secondary corridors there are extensive feeder and local/district corridors which are shorter in length and provide local access to centres and the other corridors. These are served by the bus network.
Figure 4.4: Primary Corridors - Greater Kuala Lumpur/Klang Valley

Figure 4.5: Secondary Corridors - Greater Kuala Lumpur/Klang Valley
4.6 Defining Targets For The Master Plan

The performance of the Master Plan within the Greater Kuala Lumpur/Klang Valley Region will need to be assessed using a variety of indicators based on mode share, travel time, accessibility and quality of service. Targets can be defined for these.

4.6.1 Mode Share

‘Mode Share = percentage of journeys made by public transport (including bus and rail)’

In defining mode share targets, these can be set for a Region as a whole, or as incremental targets for different areas so for example a city centre could have a higher target than outer suburban or rural areas. Targets can be set for different times of the day such as weekday peak periods, interpeak, or weekends.

As part of the NKRA, the Prime Minister has set a national priority of delivering a 25% modal share for public transport in the Klang Valley by 2012 during the morning peak period.

International comparisons of mode share against other cities show that the mode share in the Greater Kuala Lumpur/Klang Valley region is low.

Table 4.1: International Comparisons of Mode Share

<table>
<thead>
<tr>
<th>Mode Share</th>
<th>Land Public Transport (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sydney</td>
<td>22%</td>
</tr>
<tr>
<td>Berlin</td>
<td>25%</td>
</tr>
<tr>
<td>Bangkok</td>
<td>44%</td>
</tr>
<tr>
<td>London</td>
<td>45% of motorised journey</td>
</tr>
<tr>
<td>Singapore</td>
<td>59%</td>
</tr>
<tr>
<td>Jakarta</td>
<td>60%</td>
</tr>
<tr>
<td>Paris</td>
<td>62%</td>
</tr>
<tr>
<td>Seoul</td>
<td>63%</td>
</tr>
<tr>
<td>Delhi</td>
<td>70%</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>90%</td>
</tr>
</tbody>
</table>

For the Master Plan a more disaggregated approach is proposed which recognises that the region is not homogenous. The mode share targets have been defined as:

- A base target which the strategy is expected to achieve
- An aggressive target which sets an overall aim

Table 4.2 shows the 20 years target for mode share within the different areas of the region. The base target for the centre of Kuala Lumpur is 50% by land public transport with an aggressive target of 60%. The base target for the area of Kuala Lumpur surrounding the CBD is 30% which reflects the lower density of land public transport network (aggressive target 50%). For the other important centres a base target of 35% is set (aggressive target 50%). For other key points a 20% base target is set (aggressive target 35%).

Table 4.2: Mode Share Targets for Greater Kuala Lumpur/Klang Valley- 2030

<table>
<thead>
<tr>
<th>Mode Share Targets</th>
<th>Base (%)</th>
<th>Aggressive (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Centre of Gravity I = Kuala Lumpur (within Middle Ring Road 1)</td>
<td>50</td>
<td>60</td>
</tr>
<tr>
<td>Surrounding I = Kuala Lumpur (within Middle Ring Road 2)</td>
<td>30</td>
<td>50</td>
</tr>
<tr>
<td>Centre of Gravity II = Shah Alam, Klang, Putrajaya, PJ (New Town)</td>
<td>35</td>
<td>50</td>
</tr>
<tr>
<td>Other Key points = Selayang, Serdang, Rawang, Puchong, Subang, Sunway, Kajang etc</td>
<td>20</td>
<td>25</td>
</tr>
</tbody>
</table>

Figure 4.6 shows how the target mode share is expected to evolve over time from the expected 25% level in 2012 through to the future targets.
4.6.2
Accessibility- Catchment

‘Accessibility = percentage of population within 400 metres of a public transport service (including bus and rail)’

The NKRA identified that currently 63% of the population live within 400 metres of a public transport service. A number of ‘white areas’ or gaps were identified across the region.

The NKRA proposed some additional bus services to increase the percentage to 70% in the short term. The aim of the Master Plan through enhanced land public transport network planning is to increase the accessibility of the land public transport network such that 80% of the population live within 400 metres of a service.

4.6.3
Modal Quality Standards

Within the Bus and Taxi Transformation Plans there is a review of best practice in relation to standards associated with these modes.

Key Conclusions

The ranges of primary and secondary corridors have been defined for the Greater Kuala Lumpur/Klang Valley region.

Primary corridors focus on the access to the city centre of Kuala Lumpur.

Secondary corridors focus on orbital movements and the other centres.

The assessment process needs to consider the role of each mode such that the growing travel demand can be met by the appropriate mode.

A series of mode share targets have been set for land public transport in the region.

An accessibility target has been set for the region based on 80% of the population living within 400 metres of land public transport service.
5 The Master Plan Building Blocks
5.1 Introduction

Previous chapters of the Master Plan have highlighted the existing issues and future conditions in the Greater Kuala Lumpur/Klang Valley Region. These indicate that significant improvements to land public transport are required in terms of quality and quantity to meet the expectations of users, the National land public transport objectives and the aspiration for Kuala Lumpur to be a World Class city.

In order to attract non-users to land public transport there is a need to fix a number of issues in the short term including:

- The network coverage - to extend the bus service coverage such that 80% of the population live within 400 metres of a land public transport service
- To enhance the standards of the service, particularly for KTM, buses and taxis
- To improve the information about land public transport services
- To improve integration between modes
- To improve the first and last mile

In the longer term the future land use changes in terms of population and employment will influence travel patterns in the region with growing desire for movement to the primary centres, particularly to the central area of Kuala Lumpur. This intensifies the need to provide greater capacity on these corridors to cope with the demands. In addition, good station access in the central area is important in order to disperse demands across a number of access points to avoid overloading the system at a small number of key terminals or interchanges.

The URDP includes an assessment of whether the proposed committed supply can accommodate the forecast travel demands and meet the aspirations of higher public transport modal share. The analysis concluded that currently funded rail projects will not be sufficient to meet the forecast growth in travel demand given population growth and the intensification of employment in the centre of Kuala Lumpur. The introduction of the MRT1 and the LRT extensions will improve conditions in key corridors but further measures are required to enhance land public transport modal shares and provide greater comfort and reliable journeys. The impact of a congested Greater Kuala Lumpur/Klang Valley Region is likely to have economic consequences given the importance to the national economy.
Therefore the challenge is to provide an enhanced public transport system which can encourage modal transfer and reduce overcrowding by providing more capacity particularly in the peak periods. This will need greater emphasis on the role of each mode and the integration between them. Table 5.1 maps the improvements needed to land public transport against the overall objectives.

Table 5.1: Mapping Objectives to the Improvement needed

<table>
<thead>
<tr>
<th>Objective</th>
<th>Land Public Transport Improvement needed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase Economic Competitiveness &amp; Growth</td>
<td>Reduce congestion particularly for bus and taxi services, Increase mode share, Increase capacity of the system</td>
</tr>
<tr>
<td>Health, Safety &amp; Security</td>
<td>Improve safety standards of land public transport modes, Improve driver and vehicle standards, Improve security on land public transport system, Improve first and last mile to encourage walking and cycling</td>
</tr>
<tr>
<td>Improve Accessibility, Connectivity &amp; Integration</td>
<td>Increase % people within 400m of a public transport service, Increase network coverage to improve accessibility, Reduce journey times, Improve integration between modes through better interchange, Improve ticket integration between modes and operators, Improve information about land public transport services</td>
</tr>
<tr>
<td>Efficiency &amp; Affordability</td>
<td>Improve viability of land public transport services, Improve network planning of land public transport services, Improve the quality of service to achieve higher customer satisfaction</td>
</tr>
<tr>
<td>Equality of Opportunity</td>
<td>Provide more low floor buses, Improve step free access and interchange, Ensure land public transport fares are affordable</td>
</tr>
<tr>
<td>Environment</td>
<td>Improve land public transport mode share to reduce car usage &amp; congestion thus impacting on emissions, Improve vehicle standards</td>
</tr>
</tbody>
</table>

5.2 Looking To The Alternatives

In order to meet the travel aspirations of the region there are alternative scenarios that could be undertaken based on highway improvements, introduce demand management, or improved land public transport services.

A major road building programme could be adopted across the region but this would:

- Reduce congestion in the short term but will not address the issue of traffic growth in the longer term such that highway conditions will worsen again (this is seen in many international cities) which will impact on economic competitiveness
- Do little to impact on mode share as there would be little encouragement to transfer from cars thus affecting the viability of land public transport services
- Increase vehicle kilometres travelled thus impacting upon safety (accidents) and the environment (noise and pollution)
- Require land for new highways which will be environmentally damaging in the urban areas

An alternative approach would be to adopt a travel demand management strategy based on the current committed network. However, this would:

- Reduce car usage and raise revenues but may impact on the economic attractiveness of the region
- Land public transport services will be overcrowded without additional land public transport infrastructure
- Do little to improve emissions and environmental quality in the area

Therefore, greater emphasis should be placed on an improved land public transport system which can sit alongside highway and land use policy to provide a co-ordinated strategy for the region.

Table 5.2: Potential Alternative Approaches
The policies and initiatives included in this Master Plan are based on the criteria of:

- **Fix** - identify current operational issues and seek to address these (such as regulation, fares structure, monitoring and integration)
- **Improve** - upgrade operations and infrastructure to appropriate standards
- **Attract** - provide investment in the corridors through new capacity (for example new rail lines) and infrastructure
- **Push** - define complementary policy measures through land use and travel demand management allow the land public transport modal share to achieve the targets

5.3 **Roles Of The Modes**

Looking to the future of the region there will be significant changes which will impact on the roles of the land public transport modes:

- Economic growth which will encourage demographic change and the wealth of the region (this will facilitate greater desire for travel)
- Population and employment growth which still stimulate the need for additional land public transport capacity.
- New development areas which will need to be served by land public transport
- Changes in land public transport network supply through committed schemes such as the two LRT extensions and MRT1 which will change the need for bus service provision.
- Increased tourism in the region.

An approach based on significant improvements to land public transport shows much greater potential for benefits. However, this may be supported by other complementary measures to enhance mode share related to integration, supporting the urban realm and access through the first and last mile, land use policies related to new developments, and travel demand management initiatives.

Given these changes, the Master Plan defines the changing roles of the modes into the future (see Figure 5.1):

- **Rail** will be the future spine of the network in terms of capacity and accessibility
- **Bus** will support the rail system by providing feeder services to rail services and by providing services in the secondary corridors not served by rail and providing local services to district centres
- **Taxi** will fill in the gaps in space and time and provide a quality option for door to door travel where cost is not a deciding factor
Improving The Modes: - The Elements Of The Master Plan

The Subsidiary Plans for the Greater Kuala Lumpur/Klang Valley Master Plan identify in detail the land public transport elements proposed by mode. The plans respond to the challenges identified in the assessment of current and future conditions and the need to enhance land public transport in the short to long term.

The key elements and their rationale are summarised in Figure 5.2 and outlined in the following sections. Chapter 6 outlines a delivery plan for the Master Plan. More detail on the individual elements is given in the subsidiary plans. The key rationale is to:

- Address current operational, regulatory and service standards
- Improve quality
- Maximise the potential use of the current assets
- Provide new capacity as appropriate to meet future growth

**Figure 5.1: Roles of the Land Public Transport Modes**

<table>
<thead>
<tr>
<th>Role of Urban Rail</th>
<th>Role of Bus</th>
<th>Role of Taxi</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Provide the main spine of the future LPT network particularly to provide links to the centre of KL i.e. primary corridor demand</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Provide increased LPT capacity through enhancement to existing lines, extensions to existing lines &amp; the provision of new routes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Provide the key link between the city &amp; KLIA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Fill in the gaps of rail network, i.e., secondary corridor demand including Bus Rapid Transit where appropriate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Feeder Bus Services to provide quick connection to primary &amp; secondary corridors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Provide local services to suburban centres</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Provide a core public transport service to those in outlying areas outside the catchment of core and feeder services</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Provide a local service where households have no car available &amp; bus doesn’t meet their needs (for example offering accessibility for the mobility impaired, the transportation of large packages or a local destination off the bus route)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Provide a service outside conventional public transport operation hours</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• A high quality door to door service as a mode of choice for city centre trips where cost is not a deciding factor</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. Filling the gaps
2. Quality Option - Door to Door
This section summarises the rail proposals included in the URDP. The purpose of the URDP is to define broad corridors where new and enhanced lines are needed in addition to existing commitments. In line with the guiding principles the rationale behind these are to:

- Maximise the potential use of the current assets and the quality of service
- Provide an expansion of capacity to cope with demands through extensions
- Construct new lines to meet demand and future developments

### Figure 5.2: Summary of the Land Public Transport Elements

<table>
<thead>
<tr>
<th>Urban Rail Elements</th>
<th>Bus</th>
<th>Taxi</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rationale</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximise the potential use of the current asset</td>
<td>Address current operational &amp; industry failings</td>
<td>Address current operational issues</td>
</tr>
<tr>
<td>Provide an expansion of capacity to cope with demands through extensions</td>
<td>Enhance quality to increase use &amp; modal shift</td>
<td>Enhance quality to increase use</td>
</tr>
<tr>
<td>Construct new lines to meet demands &amp; future developments</td>
<td>Create integrated accessible network to cater for local &amp; regional needs</td>
<td>Create improved brand with higher standards</td>
</tr>
</tbody>
</table>

**Measures**

- Upgrade KTM service to provide a “Metro” style service
- Provision of a freight relief line
- Provision of new MRT Circle line around KL
- Provision of a new North-west to South-east MRT line to serve the city centre
- Development of an LRT line to operate between Kelana Jaya LRT, Shah Alam & Klang
- Extension of the KL Monorail
- Completion of the Putrajaya Monorail
- Development in the longer term of an outer orbital route linking suburban centres

- Provide appropriate network to meet current demands
- Provide a network of BET & for BRT services
- Provide mechanisms to enhance standards of vehicles & infrastructure
- Enable increased use of priority measures
- Enable increased enforcement
- Enable development of real time information systems & journey planners
- Develop integrated fares system
- Provide Regulatory Regime to deliver planned accessible & integrated network

- Develop new database of operators, vehicles & drivers
- Provide mechanisms to enhance standards of vehicles & drivers
- Develop driver training programme
- Enable use of priority measures as appropriate

### 5.5 Urban Rail Development Plan

This section summarises the rail proposals included in the URDP. The purpose of the URDP is to define broad corridors where new and enhanced lines are needed in addition to existing commitments. In line with the guiding principles the rationale behind these are to:

- Maximise the potential use of the current assets and the quality of service
- Provide an expansion of capacity to cope with demands through extensions
- Construct new lines to meet demand and future developments
The demand analysis in the URDP has assessed those corridors with potential demands that warrant a rail service. Alternatives have been assessed using the transport analysis tools to compare options for individual corridors, or in terms of the overall orientation of the network (e.g. north-south or east-west). In order to identify these proposals the initial technical analysis assessed the potential ridership and impacts on overall accessibility within the region.

At this stage of the Master Plan development it is appropriate to define corridors based on future levels 2.5 km radius. Following publication of the URDP, a more detailed technical assessment will be required of the engineering and operational feasibility to identify the exact alignment that should be adopted for new lines and the location of stations. This will then be taken forward to a Railway Scheme for each line.

Figures 5.3 show the potential urban rail network for the region. The measures are listed in Table 5.3 with a brief description.
### Table 5.3: URDP Measures

<table>
<thead>
<tr>
<th>Element</th>
<th>Description</th>
</tr>
</thead>
</table>
| KTM Komuter              | - KTM Komuter services will be enhanced and re-branded as “metro” services to play a greater role in the public transport system of Greater Kuala Lumpur / Klang Valley  
- Seek to provide 5 minutes headway from Klang & Seremban  
- Seek to provide 7.5 minutes headway from Rawang                                                                                                           |
| Station Upgrade          | - To assist the improvement of the KTM services, additional enhancements will be made to station facilities  
- An initial audit should be undertaken for all KTM stations to assess current facilities, feeder services and local access by all modes. Local groups will be engaged in this process  
- A comprehensive travel plan should be developed for each station to encourage greater use interchange with other modes will be enhanced and bus feeder services provided as appropriate  
- Over time it is envisaged that the greater use of KTMB stations will encourage TODs to be developed along the corridor thus enhancing the local areas around stations |
| Maintenance              | - The KTM Service enhancement will be supported by a maintenance regime to maintain the quality of the asset and encourage ridership                                                                                     |
| Freight Relief Line      | - To assist the development of the KTM passenger service, there is a requirement in the URDP to develop a freight relief line to divert freight trains to Port Klang away from Kuala Lumpur & the Klang Branch  
- The provision of a freight relief line will also allow for the growth in rail freight services associated with increased demand & through Port Klang  
- The route may also be available for passenger services and this should be investigated  
- Alternative routes will be investigated to select the most appropriate alignment                                                                                       |
| MRT Circle Line          | - Orbital movements in Kuala Lumpur will be addressed by the provision of a Circle Line linking areas such as Mid Valley, Mont Kiara, Sentul Timur & Ampang, as well as proposed development such as Matrade  
- MRT Circle Line will make use of the Ampang Branch of the Ampang Line which will allow a higher frequency service to be provided on the main LRT line towards Sri Petaling  
- MRT Circle Line will be developed in 2 phases  
- The first phase would be the western and southern sections linking Ampang with Mid Valley, Matrade and Sentul  
- The second phase would link Ampang with Sentul Timur completing the north eastern sector  
- Interchange with other lines will be provided as appropriate                                                                                                      |
| MRT N-S Line             | - A new MRT N-S line is proposed to link developing areas with the eastern half of the city centre (including Kampung Baru & Tun Razak Exchange TRX)  
- 2 northern branches are to be provided. The first will serve Selayang while the second will serve Sungai Buloh. The latter will make use of depot facilities at this location as well as providing interchange with KTM & MRT  
- The MRT N-S line will provide a link to Pandan to improve connections to this area that was identified as a transit gap by the URDP  
- In the longer term up to 2030, the line could be extended southwards towards Serdang & Putrajaya depending on the developments in that area  
- Interchange with other lines will be provided as appropriate                                                                                                      |
| Kuala Lumpur Monorail    | - A southern extension of the monorail will be completed to link new development areas                                                                                                                        |
| Putrajaya Monorail       | - The Putrajaya Monorail should be completed to provide improved local access within the city. This will provide a link to Putrajaya Sentral & encourage modal transfer to the ERL  
- The timing of this facility should be in response to development needs in Putrajaya                                                                                       |
<table>
<thead>
<tr>
<th>Element</th>
<th>Description</th>
</tr>
</thead>
</table>
| LRT3 Kelana Jaya - Klang | · A spur of the LRT line will be built linking Klang to Shah Alam and the existing LRT at Kelana Jaya  
· The aim is to cater for local movements in these areas  
· The exact alignment of the LRT is to be determined through engineering feasibility but the aim would be to complement the KTM route along a parallel alignment rather than serve the same catchment areas. Therefore the LRT3 would provide a linkage to Shah Alam from both Klang & Kelana Jaya |
| Outer Orbital Line | · In the longer term there is a need to provide some form of orbital relief along the LDP corridor. The sections through Petaling Jaya have particularly heavy private vehicle demands resulting in significant congestion. The corridor for this line has not been defined at this stage & would be subject to later investigation & stakeholder engagement |

5.6 Bus Transformation Plan

The BTP outlines the proposals to transform the bus network in the region. The keys to success of bus services which determine the focus for the elements incorporated into the BTP will be:

- Punctual and reliable services which are attractive to users
- Good access to system “first and last mile” through the provision of good pedestrian access
- Integration within the overall land public transport system to provide wider network coverage
- Competitive journey times via land public transport which are attractive to encourage modal transfer
- Comfortable modern vehicles and well-trained drivers so that bus system provides a quality service
- Good (accurate and up to date) passenger information systems that enhances users experience
- Safe and secure journeys for users
- Fare system which provides an appropriate fare level and integrated with other land public transport modes
- Sustainable industry that the network allows the industry to operate, develop and invest for the future
BRT will be used to support a number of corridors to the centre of Kuala Lumpur and for orbital routes linking key district centres.

The proposed BRT corridors have been selected to support the future rail network and also to provide additional services on corridors where there are no current proposals to implement rail facilities (see Figure 5.5).

These will provide commuters with the opportunity of travelling between residential and employment areas without the requirement to travel into the centre of Kuala Lumpur to complete their journey.

The BRT corridors will be subject to a complete package of measures.

**Bus Network Planning**

- The bus network will need to be revised to match the changes in the rail network and development areas.
- SPAD to work with operators, local authorities and Prasarana to develop an appropriate network taking into account changes in the rail network.

**Bus Priority**

- Existing bus lanes will be reviewed and enhanced to include new, clear road surfacing and appropriate road markings.
- Bus lanes will be supported by new, clear signage which informs the general traffic that they should not be using these facilities during the times prescribed on the associated signage.
- New bus priority measures will be introduced to improve service reliability on major corridors.
- Bus priority measures will be introduced on the BRT corridors.

**Red Routes**

- In order to emphasise the nature of particular corridor and city centre ‘red routes’ (also known as greenways in some cities) will be defined where there are priority to land public transport movements.
- These corridors will be subject to strong enforcement to ensure that the priorities are maintained.

**Enforcement**

- Enforcement will be strengthened.
- Use will be made of bus mounted video cameras which have the benefit of surveying the whole bus lane corridor.
- Appropriate enforcement action will be taken against the offending vehicles.

**Vehicles**

- New Vehicles will be introduced through the regulatory regime in terms of the specifications of standards for each individual route.
- Vehicles should be low floor (whether single or double deck) to allow for access for all user groups. This requirement will be tracked through the regulatory regime.
- The regulatory regime will also allow the enhancement of standards related to other enhancements to the fleet (including seating standards, information, air conditioning/cooling, and security/safety measures).
- Over time, operators will be required to provide newer vehicles with increased fuel efficiency and environmental standards, particularly related to emissions. Over time this will lead to significant enhancements in the Kuala Lumpur bus fleet.

**Vehicle Maintenance Checks**

- There should be an enhanced regular programme of Vehicle Maintenance checks.
- There will not only assess the vehicles mechanical status but also the performance of the vehicle against a number of quality checks.

**Driver Training Programme**

- A driver Training and Testing regime will be implemented in order to improve driver quality standards.
- SPAD will work with key stakeholders to set up a driver training scheme.

**Bus Stop Information**

- The NKRA programme of bus stop improvements will be expanded to the entire Greater Kuala Lumpur/Klang Valley region.
- All stops to have basic information including maps and timetables.
- Key stops to have shelters and real time information.

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<th>Element</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Information</td>
<td>• Through the Regulatory framework, operators will be required to specify the routes served and the schedule.</td>
</tr>
<tr>
<td></td>
<td>• Route timetable information will be available for each stop.</td>
</tr>
<tr>
<td></td>
<td>• Travel information will also be available as a paper-based travel guide and map for the region as a whole.</td>
</tr>
<tr>
<td></td>
<td>• Web phased and mobile-based information systems will be developed over time.</td>
</tr>
<tr>
<td></td>
<td>• Detailed journey planner allowing the user to find a route by land public transport between addresses, or stops will be introduced.</td>
</tr>
<tr>
<td></td>
<td>• Over time, real-time information systems will be provided to allow users to assess the arrival time of buses per stop or identify on a plan the location of vehicles on a route.</td>
</tr>
<tr>
<td>Fares</td>
<td>• The integrated ticketing system currently available on Rapid Kuala Lumpur services will be available for all modes and operators (such as for the London Oyster Card or the Hong Kong Octopus Card).</td>
</tr>
<tr>
<td></td>
<td>• Encouragement of cashless ticket systems which will reduce fraud.</td>
</tr>
<tr>
<td>Regulatory Regime</td>
<td>• The key implication for planning a network to respond to these changes is that there will need to be a change in the regulatory regime.</td>
</tr>
<tr>
<td></td>
<td>• There should be a switch to a contracting regime.</td>
</tr>
<tr>
<td></td>
<td>• A regulatory regime which sees greater control exerted by the public sector brings wider benefits associated with: supporting governmental policies and objectives; meeting services standards; and increasing public satisfaction with bus services.</td>
</tr>
<tr>
<td></td>
<td>• In order to generate this data, it is important to ensure that an effective Performance Monitoring Regime (PMR) is implemented to ensure that data flows freely between the public and private sector. A ‘PMR’ would ensure that the operator returns full and complete data - specified by the public sector on a frequent basis.</td>
</tr>
</tbody>
</table>

Figure 5.4: BRT Corridors
5.7 Taxi Transformation Plan

In order to transform the taxi industry in the Greater Kuala Lumpur/Klang Valley region, a series of initiatives have been identified. A market led approach will be adopted transforming the taxi industry with enhanced quality standards and tightened licensing requirements. This emphasis is on quality regulation rather than numerical regulation as the World Bank's favoured approach.

The TTP examines methods to raise the quality of the service through:

- The regulatory framework
- Raising driver standards
- Raising vehicle standards
- Booking systems
- Branding
- Infrastructure
- Enforcement
The regulatory framework will seek to balance supply with demand for taxi services. The recommended quality improvements are set out below.

**SPAD** are currently in the process of moving all individual taxi vehicle licenses to operator licenses. This process will be completed by end of 2011. There will be an ongoing requirement for all those owning taxis to obtain a vehicle and an operator license from 2012.

Drivers must obtain their driver’s card as per the existing situation.

To become an operator, individuals will be required to obtain two vehicles. This additional requirement will form part of the required increase in quality restriction.

For the immediate future, the fare structure will be maintained with some minor modifications to address current identified issues.

A regular review of fares will be undertaken by SPAD in light of a number of factors including operating costs, affordability and driver revenue.

A fares index will be developed by SPAD to allow the review of fares to be undertaken annually.

**Centralised Customer Centre**

- A centralized dispatch/booking system will be developed which would send a vehicle wherever the customer required.
- It is envisaged that this will allow taxi reservations to be made 24 hours a day via the internet or a telephone hotline number.
- In order to ensure the customer service centre is successful, the proportion of taxis on radio circuits needs to be significantly increased.
- In addition to the booking system, the centre will manage complaints and feedback.
- Coordination with all operators to ensure a common process is developed and complaints are forwarded to the central system.
- A wide ranging marketing campaign must be delivered as the system goes live to include, radio, leaflet, online and in taxi marketing.

**Vehicle Class**

- SPAD are to introduce a third class of vehicle between the budget and executive classes in order to encourage quality in the fleet.
- The vehicle will operate on its own fare structure and looks to address some of the requests of the industry and public, namely, GPS, Credit & debit facility, Radio communication, MPV vehicle, 80 cm luggage area, >20 cm leg room, 1.3m seat length, Airbag, Auto-transmission, disabled friendly (with modifications).

**Vehicle Standards**

- The standards should be revised in order to ensure higher quality; more spacious vehicles can be used where appropriate particularly in the budget class.
- The vehicles will be checked bi-annually against the benchmark set to ensure they continue to meet vehicle specifications, safety and quality levels.
- The age limit will be set at 8 years old as this will continue to allow vehicles to be purchased on 7 years finance schedules. This requirement should be brought in for all new vehicle license applications.
- If appropriate SPAD can choose to continue to license older vehicles under an “exceptions” policy which would incentivize drivers and operators to maintain their vehicles to the highest standards and if at 8 years the vehicle was of a sufficiently high standard it could continue to be licensed for periods of 6 months at a time.

**Scrapage Incentive Scheme**

- Introduce a vehicle scrapage incentive in cooperation with the vehicle manufacturers.

**License Renewal**

- Best practice suggest that the maximum period a vehicle should be licensed for is a period of 3 years from first license.
- Renewal must be subject to a vehicle safety and quality inspection to ensure standards are maintained and applied in a consistent manner.

**Driver Training & Testing**

- A driver training and testing regime will be implemented in order to improve driver quality standards. The licensing process must be reviewed in order to implement this requirement to attend mandatory training.
- A comprehensive medical process will be introduced in line with the findings of the international best practice. A medical assessment should be obligatory for all drivers.

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<td>Driver License &amp; Renewal</td>
<td>• Quality can be improved through the abolition of automatic renewals and the introduction of cross checking at license renewal.</td>
</tr>
<tr>
<td>Enforcement</td>
<td>• While enforcement of moving vehicles must be carried out via the police, SPAD enforcement officers will carry out regular spot checks of vehicles at ranks to ensure standards are being met.</td>
</tr>
<tr>
<td>Bus Lanes</td>
<td>• Customer complaints will be regularly monitored and reviewed to identify persistent vehicle or driver deficiencies.</td>
</tr>
<tr>
<td>Taxi Stand Provision</td>
<td>• Allow taxis to use bus lanes where these exist and to ensure the design of new at grade bus lanes or priority infrastructure also allows for taxis</td>
</tr>
<tr>
<td></td>
<td>• The provision of more stands in the correct locations, in or adjacent to key demand generators will help reduce circulation and drivers km travelled per day.</td>
</tr>
<tr>
<td></td>
<td>• Taxi stands need to be conveniently located in areas of demand such as local shopping centres, major terminals, MRT stations, local interchanges and other key locations such as leisure or tourism sites.</td>
</tr>
<tr>
<td>Performance Management</td>
<td>SPAD will undertake to:</td>
</tr>
<tr>
<td></td>
<td>• Set a number of performance indicators in order to measure progress under each of the objectives.</td>
</tr>
<tr>
<td></td>
<td>• Set quantitative and qualitative targets for each indicator.</td>
</tr>
<tr>
<td></td>
<td>• Progress will be monitored against the targets annually.</td>
</tr>
<tr>
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<td>• Progress notes setting out the results of monitoring exercise will be published along with any resulting amendment to the policies.</td>
</tr>
<tr>
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<td>• Targets will be reviewed every two years.</td>
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### 5.8 Supporting the Plan

The modal elements identified above need support from other complementary initiatives as outlined in the Interchange and Integration Plan, the Land Use Plan and The Travel Demand Management Plan. These seek to reduce the barriers to modal shift and encourage further land public transport ridership.
5.8.1 Interchange and Integration Plan

The purpose of the IIP is to review the current status of interchange and integration as well as developing guidelines for interchange design and planning. The Subsidiary Plan also identifies the strategy intended to enhance the integration of land public transport and focuses on multimodal interchange between one mode of public transport and another, but where appropriate also considers interchange between land public transport and feeder modes such as walking, cycling and motor vehicles.

The current provision of interchange between land public transport modes is inadequate due to physical and ticketing constraints. It is not possible to interchange between rail networks in the Klang Valley without having to first leave the ticket barriers of each individual station. There is however on-going NKRA UPT initiatives aimed at improving the integration of land public transport system.

The focus of the guidance is on multi-modal interchange between one mode of public transport (and another land public transport mode). It also considers the interchange between public transport and its ‘feeder’ modes for example walking, motorcycle and private car vehicles. The guidance is intended to supplement, rather than replace, current standards and other legal and discretionary requirements that apply to planning, design and operation of public transport interchanges and should be interpreted in the context of these standards.

In line with the URDP, it is anticipated that there will be additional interchange stations on urban rail network, both between the new lines and between the new lines and the existing lines. This will not only result in more convenient land public transport services for passengers but also create an operationally more efficient and balanced land public transport system.

A well planned interchange that is properly integrated into its surroundings and feeder modes will support efficient land public transport operations and increase the overall convenience and attractiveness of land public transport. An accessibility strategy for station is intended to provide a general guide to determine the provision of access for other feeder modes such as pedestrian, bus, taxi, kiss & ride and park & ride, so that they are consistent with the roles and functions of the interchange.
5.8.2 The First and Last Mile

The land public transport element is only one part of the passenger journey. Integration with other modes (public, transport, private transport, walking and cycling) is important to maximise the potential usage of land public transport. This can be referred to as the ‘first and last mile’. The requirements for the ‘first and last mile’ will vary between the different accesses modes. The Interchange and Integration Plan considers these requirements in more detail.

The integration requires:

- A network of feeder bus services to provide linkages to stations
- Good interchange facilities between modes to reduce the ‘barrier’ of changing modes
- Facilities should include systems to provide real time passenger information on the availability of bus and rail services
- Stations should provide local information (maps) to show local facilities, and access routes
- Easy access routes should be provided including consideration of covered footways where appropriate but should include road - crossing facilities either at-grade or above/ below ground
- Stations and their accesses should be secure with adequate lighting and close circuit security systems
- Stations should provide cycle and motorcycle parking facilities
- Integrated ticket systems should be introduced to allow users to use one ticket/ smart-card which can be used on all modes
- Transit Oriented Developments (TOD) should be encouraged to allow housing and commercial developments close to the stations which will encourage use of public transport
5.8.3 Land Use

In order to support the modal initiatives set out above, there are other policy instruments that are needed to give assistance to increasing land public transport mode shares. The Land Use Plan (LUP) has identified mechanisms to influence land use policies and planning process in the Greater Kuala Lumpur/Klang Valley region to favour public transport provision and performance in support of the overall Master Plan objectives.

The responsibility of the land use development and planning generally rests with the state and local authorities. By shaping the pattern of development and influencing the location, density and mix of land uses, land use policy levers can help to reduce the need to travel and make it easier for people to travel by land public transport and walking. Those that seek to provide a positive influence on land public transport demand include:

- Prioritise high density developments at land public transport accessible locations
- Secure good land public transport access and facilities for new developments

Land use policy levers that seek to provide a negative influence on private vehicle demand through measures such as:

- Development control to consider wider transport implications including land public transport
- Deter developments generating high traffic demand in area with poor land public transport access
- Parking control policies to promote mode shift to land public transport

Developing pragmatic and practical mechanisms where SPAD can constructively intervene in the planning process to favour public transport is integral to achieving the objectives of Greater Kuala Lumpur/Klang Valley Master Plan. With the assistance from SPAD, local authorities should seek to make land public transport assessment a mandatory requirement as part of the land use planning and development control process. SPAD can provide technical guidance and resources to develop technical guidelines and to assist in the land public transport assessment.

Using financial mechanism to provide incentives to land use developments (i.e. TOD) that are supportive to the Master Plan objectives. Financial contribution can also act as a deterrent to discourage high density development at locations without good access to land public transport.

Partnerships with state and local authorities is crucial to gain their support in the wider objectives of Master Plan and to promote the integration between land use and land public transport planning throughout the development of land use policies and planning process.

5.8.4 Travel Demand Management

The supply-led building blocks for the Master Plan are outlined in the Subsidiary Plans (BTP, TTP, and URDP). However in many circumstances there is a need for demand led shifts which seek to increase the usage of land public transport within the existing supply levels or in tandem with supply based measures. A range of TDM measures have been reviewed in the production of this plan to assess those with potential in Greater Kuala Lumpur/Klang Valley.

In order to influence demand, there are two basic approaches to achieving a demand shift to public transport from private transport. The first are termed ‘Pull’ initiatives (sometimes also referred to as ‘Carrots’) which seek to provide a positive influence on demand through measures such as integrated ticketing, information, travel planning and priority systems. The second set of approaches are termed ‘Push’ initiatives (sometimes referred to as ‘Sticks’) which seek to provide a negative influence on private vehicle demand through measures such as vehicle use restrictions, fuel price, parking charges or road user charging (RUC).
The selection of the TDM measure often reflects the priority of the objectives being considered. Among the common objectives for TDM include:

- The reduction of congestion by measures aimed at reducing peak period demands
- Achieving a behavioural change to encourage a modal transfer from private vehicles to public transport
- Increasing the efficiency of the network such that the focus is on the movement of people rather than private vehicles
- Reducing emissions so as to have a positive impact on the environment
- Generating revenue which can be used to support public transport policies and services.

In order to support the Master Plan the following measures are needed:

- Developing priority measures for bus, taxi and non-motorised modes;
- Integrated ticketing
- Encouraging flexible working hours and telecommuting in order to spread the peak period travel demands
- Travel Planning Information, including the development of workplace and school travel plans
- Advertising campaigns
- Parking controls
- Fuel price policy
- Road pricing and or congestion pricing

The timing of RUC schemes is crucial in that land public transport alternatives should be in place to allow users to change mode. Within the Kuala Lumpur City Plan, Strategic Direction 5.10 relates to restraining traffic within the City Centre. This policy envisages restraining traffic within City Centre through Congestion Pricing to achieve an efficient use of road space. The document suggests 14 road pricing stations to establish a cordon within the MRR1. However, the policy does suggest that congestion pricing should only be introduced once all public transport is in place.

At this stage it is too soon for the Master Plan to indicate when RUC might be needed for the Greater Kuala Lumpur/Klang Valley Region. The Master Plan recommends that RUC should be investigated further through a feasibility study with a view to determining the type of scheme (in terms of type, area, and charge).

Key Conclusions

A range of initiatives have been identified for the Master Plan.

These seek to fix existing issues for current users, provide improvements through new initiatives and attract more ridership through new infrastructure.

The URDP provides proposals to upgrade the existing KTM Komuter service and identifies corridors for new LRT and MRT services. The exact alignment of the new lines will be determined through detailed technical feasibility.

The BTP outlines measures to transform bus services in the region. This includes providing new services and infrastructure including BRT and BET services underpinned by changes to the regulatory regime.

The TTP outlines measures to improve standards of the taxi industry to provide a higher quality service.

These are supported by other measures to enhance land public transport mode share through integration of the modes, improvements to the first and last mile.

Land Use policy will be used to support the enhancement of land public transport services.

TDM measures will be introduced as appropriate to encourage a modal transfer from private vehicle to land public transport.
6 Phasing and Delivery
6 Phasing and Delivery

6.1 Phasing

The proposed time line for the implementation of the projects is shown in Figure 6.1. The rationale behind the timing and staging of the projects depends on achieving value for money, the expected levels of overcrowding on key corridors and how advanced the individual projects are. The figure also includes the timeline for the committed schemes such as the LRT extensions and the construction of the MRT1.

In the short term the focus will be on the elements in the BTP and TTP. This includes a number of short term and 'quick wins' initiatives to improve bus stop infrastructure, passenger information systems, the changes to the taxi licensing database and a number of the taxi quality initiatives.

The re-casting of the bus network will begin with the introduction of the first BRT corridors and the establishment of bus feeder networks and BRT corridors. Early priority should be to introduce monitoring, benchmarking and reporting systems that will enable any weakness in operational and financial effectiveness to be identified and addressed so that existing services operate to their maximum potential from an early date. As more data is gathered through the Performance Management Regime, the process of contracting can be established.

The development process of extensions of Ampang Line, Kelana Jaya Line and also MRT1 are planned to commence in 2012, which expected to be completed by 2015 and 2017.

The KTM upgrade project is identified for the period up to 2015. As part of the NKRA new rolling stock sets are due to be delivered in the next year which will allow a reduction in headway on the KTM service. Investigations should be undertaken to confirm the potential of 5 minute headways and service patterns (timetabling) on the Klang, Seremban and Rawang operations. This will include a review of signalling, track operations, station access and facilities, power supply and the use of the central stations. This will be supported by the development of the bus feeder networks and the re-branding of the services to a 'metro' style service.

A crucial element for the delivery of the 5 minute passenger service headway will be the Freight Relief Line. The route should be confirmed as soon as possible to enable its construction to facilitate the re-routing of freight services away from the city centre of Kuala Lumpur. The timing of the construction would be confirmed during those investigations.

The MRT Circle Line should be built in two phases. The first phase includes the section from Ampang to Sentul Timur via Mid Valley. Initial investigations would need to confirm the exact alignment, technical and engineering feasibility, station locations and depot locations. It is anticipated that much of the new construction sections would need to be in tunnel sections. The construction of this phase should tie in with the key developments in the corridor such as Matrade.
The proposal includes the use of the existing Ampang Line so there will be a period when that section is converted from LRT to MRT. This will require alternative bus transport provision during the construction phase. The LRT line to Sri Petaling and Putra Heights can benefit from additional capacity once LRT services cease on the Ampang spur line.

The second phase of the MRT (North Eastern section) would be built at a later date. The completion of this corridor will be subject to viability in terms of travel demand and feasibility.

### Figure 6.1: Master Plan Summary

<table>
<thead>
<tr>
<th>2011</th>
<th>2015</th>
<th>2020</th>
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<td><strong>Performance Monitoring</strong></td>
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: Proposal

**: Implementation subject to viability in terms of travel demand, feasibility etc.

The MRT North-South line should be built in two phases. The first phase includes the section from Selayang and Sungai Buloh to Pandan. Initial investigations would need to confirm the exact alignment, technical and engineering feasibility, station locations and depot locations. It is anticipated that the sections in the city centre would need to be in tunnel sections. The branches to Selayang and Sungai Buloh will be investigated in the technical study. A key consideration will be the location of the depot and this should be investigated at an early stage in order to identify the land requirements.

The second phase of the MRT (southern section) would be built at a later date. The completion of this corridor will be subject to viability in terms of travel demand and feasibility.

The Kuala Lumpur monorail extension should be considered by 2016 to enable it to tie in with development proposals along the corridor. The proposed corridor will be subject to viability in terms of travel demand and feasibility. Similarly the completion of the Putrajaya Monorail to provide greater connectivity between the city and the Putrajaya Sentral Station...
should be investigated for viability in relation to demands. The timing will be dependent on the local needs for the link to be constructed.

The Outer Orbital Line is a long term aspiration prior to 2030 and should be investigated when the local demands and modal share targets identify the need for the service.

In the longer term there will be consideration to a RUC schemes. However it is crucial that land public transport alternatives are be in place to allow users to change mode. This is in accordance with the Kuala Lumpur City Plan, Strategic Direction 5.10.

At this stage it is too soon for the Master Plan to indicate when RUC might be needed for the Greater Kuala Lumpur/Klang Valley Region. The Master Plan recommends that RUC should be investigated further through a feasibility study with a view to determining the type of scheme (in terms of type, area, and charge).

6.2 Funding

There are several sources of funds that may potentially be accessed by SPAD arising from its role as a transport authority. These sources can be broadly divided into the following categories: sources within SPAD’s control, sources that SPAD can potentially influence, and sources outside of SPAD’s control. All the measures listed here will require detailed evaluations and stakeholder engagement prior to implementation. However, given the quantum of investment involved in land public transport infrastructure, the amounts raised will unlikely be able to fund the immediate capital expenditure requirement.

6.2.1 Within SPAD’s Control

Road user charging (RUC)

- Otherwise known as congestion pricing, RUC involves the establishment of a zone around a city’s Central Business District (CBD), where vehicles are charged a public levy for entering the CBD. This levy may vary depending on the day (weekday or weekend), time of day, and class of vehicle.
- Implementation involves the initial construction of the physical congestion pricing system, which requires minimal continuing maintenance; however, the largest costs come from ongoing administrative and enforcement expenses.
- Already adopted in London (where it raised £312.6mil worth of revenue in 2010), Stockholm (850.0mil Krona in 2008), and Singapore (S$144.0mil in 2008), congestion pricing is an effective way to limit inner-city traffic while encouraging people to adopt public transport. It can also be an avenue for raising significant amounts of revenue for the city.

Vehicle licensing

- This is an existing source of revenue, and is therefore unlikely to be able to provide extra funding. However, the new bus licensing procedures have the potential to generate additional revenue due to its three-tiered structure for bus operators, vehicles and routes.
6.2.2

SPAD Can Potentially Influence

The following money streams indirectly arise out of SPAD’s regulatory role. However, the degree to which SPAD can influence the flow of funds and its use is limited:

Fare box revenue for rail and bus
- Whilst SPAD has some degree of influence over fares, revenue will flow to the public transport operating companies.

Parking charges
- As a travel demand measure, SPAD may consider influencing public parking charges or introducing private parking levies. The revenues will be collected by either local authorities or private operators.

Real estate development premiums
- This involves a levy being charged on all real estate development that takes place within a certain perimeter of train stations. Levies may vary according to distance from the given station. Revenues from this source: will most likely be collected by city councils, depending on the location of each station.

6.2.3

Outside SPAD’s Influence

These are sources that SPAD must approach the Government for, but SPAD has no say on how these funds are generated or subsequently allocated:
- Bond and Sukuk issuances
- Road taxes
- Fuel subsidies
- Carbon credits
- Car import tariffs

6.2.4

Other Potential Sources Of Revenue

Taxes on car ownership
- In some countries, taxes on car ownership have been used as a travel demand management mechanism. For example, under Singapore’s Certificate of Entitlement (CoE) system, car owners bid for the right to own private vehicles via fortnightly auctions. CoE are a significant source: of revenue (SGD$1.4bil in 2010) for the Land Transport Authority (LTA). In the Malaysian context, the closest equivalent is the Approved Permits (APs), which are issued to control the import of foreign vehicles. However there is currently no charge for the issuance of APs.
- Implementing a car ownership tax must be considered in the context of the national car policy, current duties in imported cars, fuel subsidies, road taxes and other political considerations.

6.3

Delivery

This section outlines the lead agencies responsible for the delivery of each of the elements identified in the Master Plan. Figure 6.2 shows the implementation of the quick wins within the remainder of 2011 with SPAD’s involvement and the support from other partners. Figures 6.3 to 6.6 show the delivery plans by period including:
- Figure 6.3 shows 2012
- Figure 6.4 shows the period to 2016
- Figure 6.5 shows the period 2016 to 2020
- Figure 6.6 shows the period post 2030
### Figure 6.3: Delivery Plan - 2012

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<th>Initiatives</th>
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**Successful execution requirements:**
- Make quick, impactful PT services visible for all
- Key criteria for selection:
  - Low Risk of Failure
  - Key risks: Requires cooperation from others

### Figure 6.4: Delivery Plan - 2013 - 2016

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**Successful execution requirements:**
- Requires cooperation from others

### Figure 6.2: Quick Wins Delivery - 2011

**Figure 6.2: Quick Wins Delivery - 2011**

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**Successful execution requirements:**
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<td>Ongoing</td>
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<tr>
<td>Taxi Fare Dispenser</td>
<td>SPAD</td>
<td>Dec 2011</td>
</tr>
<tr>
<td>Taxi Partnership</td>
<td>SPAD</td>
<td>Ongoing</td>
</tr>
<tr>
<td>Others</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Integration</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bus &amp; taxi</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rail</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Successful execution requirements:**
- Requires cooperation from others

**Table:**

<table>
<thead>
<tr>
<th>Initiatives</th>
<th>Owner</th>
<th>By when</th>
</tr>
</thead>
<tbody>
<tr>
<td>KTM Station Audit</td>
<td>SPAD, KTM</td>
<td>Apr 2012</td>
</tr>
<tr>
<td>Station Upgrade</td>
<td>Prasarana, KTM</td>
<td>Dec 2011</td>
</tr>
<tr>
<td>Review Maintenance Regime</td>
<td>SPAD, KTM</td>
<td>Dec 2011</td>
</tr>
<tr>
<td>Bus Network Planning</td>
<td>SPAD, KTM</td>
<td>Ongoing</td>
</tr>
<tr>
<td>Vehicle Standards</td>
<td>SPAD</td>
<td>Ongoing</td>
</tr>
<tr>
<td>Driver Standards</td>
<td>SPAD</td>
<td>Ongoing</td>
</tr>
<tr>
<td>Taxi Smart</td>
<td>SPAD</td>
<td>Ongoing</td>
</tr>
<tr>
<td>Use of Bus Lanes</td>
<td>SPAD</td>
<td>Ongoing</td>
</tr>
<tr>
<td>Taxi Enforcement</td>
<td>SPAD</td>
<td>Ongoing</td>
</tr>
</tbody>
</table>
Key Conclusions

An Implementation Plan has been prepared for the Master Plan

In the short term, focus will be on quick wins to improve the quality of land public transport in the Greater Kuala Lumpur/Klang Valley region. This includes measures to transform the bus and taxi industries by raising standards and providing information.

In the medium to longer term the focus will be on providing additional land public transport capacity through the provision of BRT corridors, new feeder bus services and new rail lines.
7 Benefits
7 Benefits

7.1 Summary Of Benefits

Table 7.1 provides a summary of the benefits of the Master Plan.

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Indicator</th>
<th>Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economic Competitiveness</td>
<td>Access to jobs</td>
<td>Increased land public transport provision will significantly enhance accessibility for workers to reach jobs across the region.</td>
</tr>
<tr>
<td></td>
<td>Access to International Links</td>
<td>Improved land public transport links will be provided to Kuala Lumpur Sentral to facilitate international access to KLIA</td>
</tr>
<tr>
<td></td>
<td>Reduce Journey Times</td>
<td>Improved land public transport supply will reduce door to door land public transport journey times (particularly waiting and access times) and will encourage modal transfer leading to reduced congestion for other vehicles.</td>
</tr>
<tr>
<td></td>
<td>Increase Reliability</td>
<td>Reduced congestion for private and commercial vehicles will aid reliability. Land public transport system reliability will be improved through better maintenance and monitoring of vehicle standards.</td>
</tr>
<tr>
<td>Access Connectivity &amp; Integration</td>
<td>Improve Accessibility</td>
<td>Increased land public transport supply will close the transit gaps allowing more people access to the system. The target for the Master Plan is a bus network which can be accessed within 400 metres by 80% of the population.</td>
</tr>
<tr>
<td></td>
<td>Improved integration between modes</td>
<td>Interchanges between rail and other modes will reduce the ‘barriers’ of making a land public transport journey. This will be also enhanced by integrated ticketing between modes and operators.</td>
</tr>
<tr>
<td></td>
<td>Improved integration between Transport &amp; Land Use Planning</td>
<td>The Master Plan is consistent with the DBKL transit corridors. The assessment takes account of the plans of the DBKL City Plan, Selangor State Plan and local authority plans. The Master Plan will aid TODs along the transit corridors.</td>
</tr>
<tr>
<td>Social Inclusion</td>
<td>Providing access for all through better Connectivity</td>
<td>Increased land public transport supply will close the transit gaps. The use of new vehicles, improvements to the first and last mile and to bus stop and station infrastructure will allow access for all.</td>
</tr>
</tbody>
</table>
Objectives | Indicator | Impact |
--- | --- | --- |
Efficiency | Operations | The Master Plan seeks to improve bus service reliability through improved standards and priority measures. The use of new vehicles and rolling stock will improve reliability. |
 | Encourage modal shift | Mode shift will be encouraged to The Master Plan seeks to improve through the plan measures. |
 | Cost, Value for money and fundability Deliverability | The measures that are adopted are part of an overall plan that seeks to provide value for money. Each element and delivery plan has been identified. |
Safety & Security Environment | Providing improved safety and security | The design of the new services will take into account the needs of all users. |
 | Reduce road accidents through modal transfer | The encouragement of modal transfer will reduce the vehicle kilometres travelled in the region thus reducing accidents. |
 | Improve air quality through modal transfer | Modal transfer will reduce private vehicle kilometres and congestion thus improving air quality. |

7.2 Review Of Benefit

The key benefit of the Master Plan is providing the basis for a planned network where the roles have clearly defined roles and where the Master Plan proposals can sit alongside the City, State and Local Plans produced by local authorities. The corridors identified in the URDP will allow authorities to allow TOD’s to encourage land public transport ridership in those corridors. The change in the regulatory framework as part of the BTP will allow the bus network to developed in line the changing rail network facilitate support between the modes rather than inefficient competition.

7.2.1 Land Public Transport Network Provision

The elements of the URDP seek to increase peak capacity to meet future demand, reduce crowding on the radial primary corridors and improve accessibility. These are supported by improvements to the bus network including the provision of BRT corridors which seek to ‘join-up’ these routes with improved orbital services.

The future rail network is summarised in Table 7.2 with potentially over 496 km of network and over 270 stations. By 2030 the provision of the rail network will increase to 34 km/ million people which is comparable to a number of other major cities such as Beijing (29 km/ mil people), Moscow (28 km/ mil people), Seoul (28 km/ mil people), Tokyo (37 km/ mil people) and Hong Kong (41 km/ mil people). Headways will be increased on all services. The increased land public transport provision will significantly enhance accessibility in the region which will assist the economic performance.

7.2.2 Ridership

The enhancement to KTM by making the most of the existing rail network and the provision of the new MRT lines, provide greater radial capacity. The URDP is forecast to lead to 2.5X increased ridership on the KTM services (through reduced waiting time, improved reliability, faster journey to Kuala Lumpur). The URDP will lead to increased ridership of 2X on the LRT and Monorail services where they are expected to support more local demand with increase capacity and line extensions. Ridership levels on rail will increase 5 fold to increase public transport modal share, particularly
Table 7.2: Future Rail Network

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Route Length</th>
<th>No. of stations</th>
<th>Peak Hour Headway</th>
<th>Forecast Daily Ridership</th>
</tr>
</thead>
<tbody>
<tr>
<td>KTMB Metro (upgrade from Komuter)</td>
<td>157 km</td>
<td>50</td>
<td>5 mins</td>
<td>237,000</td>
</tr>
<tr>
<td>Kelana Jaya (Putra) (Includes extension)</td>
<td>29km Extension=17km</td>
<td>24 Extension=13</td>
<td>2.5 mins</td>
<td>496,000</td>
</tr>
<tr>
<td>Ampang (Star) LRT2 (includes extension)</td>
<td>27 km Extension=17.7km</td>
<td>25 Extension=13</td>
<td>2.5 mins</td>
<td>352,000</td>
</tr>
<tr>
<td>Kuala Lumpur Monorail (includes extension)</td>
<td>16 km Phase 1=7.5km Phase 2 = 8km</td>
<td>20 Phase 1=9 Phase 2 = 10</td>
<td>5 mins</td>
<td>115,000 increasing to 172,000</td>
</tr>
<tr>
<td>Kuala Lumpur Metropolis Extension</td>
<td>4.24 km</td>
<td>5</td>
<td>5 mins</td>
<td>62,500</td>
</tr>
<tr>
<td>KLIA</td>
<td>57 km</td>
<td>5</td>
<td>15 mins</td>
<td>16,500</td>
</tr>
<tr>
<td>MRT1</td>
<td>50.8 km</td>
<td>36</td>
<td>3 mins</td>
<td>445,000</td>
</tr>
<tr>
<td>MRT Circle Line</td>
<td>Phase 1=29km Phase 2=11.6km</td>
<td>Phase 1=22 Phase 2=30</td>
<td>3 mins</td>
<td>320,000 increasing to 440,000</td>
</tr>
<tr>
<td>MRT North-South Line</td>
<td>Phase 1=38km Phase 2=23km</td>
<td>Phase 1=26 Phase 2=41</td>
<td>3 mins</td>
<td>316,000 increasing to 500,000</td>
</tr>
<tr>
<td>LRT3</td>
<td>23.5km</td>
<td>16</td>
<td>5 mins</td>
<td>100,000</td>
</tr>
</tbody>
</table>

Note: *station provision for MRT Circle Line, MRT North South Line and LRT3 is an initial estimate at this stage and will be subjected to confirmation during a detailed technical feasibility study.

An initial forecast of the overall mode share within the region has been undertaken using the Greater Kuala Lumpur/Klang Valley Transport Model (see Figure 7.1). This provides forecasts for the morning peak assessing the behavioural travel changes associated with the Master Plan measures including all the elements of the Subsidiary Plans allowing for assumptions related to feeder networks and the provision of TOD’s. The plan has also been assessed with/ without Road User Charging (RUC) as this is a major policy step. This shows that a regional target of over 40% can be achieved if all the elements including the land use policy instruments are included. For travel to/from and within the MRR1 a much higher mode share is forecasted.
7.2.4 Journey Times and Accessibility

The journey time maps to the centre of Kuala Lumpur in Figure 7.2 show a much greater area of lower land public transport travel times with the Master Plan compared to existing commitments. Accessibility has also been mapped with the Master Plan improvements and shown in Figure 7.3. This shows a greater area of improved accessibility including areas along the additional MRT lines and in the Klang Valley. This will assist the economic performance of the region. Improved access will be achieved through the provision of increased bus services such that 80% of the population live within 400 metres of a service.

Figure 7.1: Forecast Mode Share
(Source: Greater Kuala Lumpur/Klang Valley Transport Model)

Figure 7.2: 2020 Modelled Perceived Travel Time to KLCC/with the Master Plan
7.2.5  
Creating a World Class City

The NKEA has an aspiration for the Kuala Lumpur to be among the top 20 most liveable cities in the world. The improvements in the Master Plan will seek to create a quality public transport system that provides access to all and links key areas within the region.

Key Conclusions

The benefits of the Master Plan will be to transform land public transport in the region

Network coverage will be increased through rail and bus services thus providing a network where 80% of the population live within 400 metres of a service

The rail network and associated feeder services will improve journey time for users thus increasing accessibility

The improvements in land public transport will increase mode share

The improvements will create a world class land public transport system for a world class city

Figure 7.3: 2020 Accessibility Map - with Master Plan
8 Monitoring
8 Monitoring

8.1 Monitoring Process

The Master Plan provides a 20 years plan for transforming land public transport in the region. A series of targets are identified as part of the plan (e.g. Mode Share, % Public within land public transport catchments). The performance of the Master Plan will need to be assessed using a variety of Key Performance Indicators (KPIs) which relate to the objectives and sub-objectives of the Master Plan. Monitoring of the plan will be important:

- To assess performance of the Master Plan
- To review any changes needed to Master Plan
- To provide confidence to Public and decision makers of improvements to land public transport
- To provide a standardised database of land public transport data for use by SPAD and other agencies;
- To provide data for model updates
- To provide data for consistent planning and other ad-hoc projects, including development control

The Monitoring needs to tie into Master Plan objectives and build upon the NKRA monitoring already being undertaken. A database of land public transport data for the Greater Kuala Lumpur/Klang Valley region is being developed by SPAD and this will be updated regularly making use of existing data and new surveys as required. This will make use of continuous data as well as periodic and annual surveys. A survey programme will be designed by SPAD to collect data for the relevant indicators. The goal is that there should be an Annual Transport Monitoring Report for the Greater Kuala Lumpur/Klang Valley region. (See Figure 8.1).
The mapping of indicators against objectives is shown in Table 8.1. Each element will require a rolling programme of surveys to monitor performance. In addition to any new surveys undertaken information can be identified from other sources including:

- NKRA monitoring surveys undertaken in 2010 and 2011 - including traffic counts, land public transport surveys, travel times and customer satisfaction surveys
- Local authority traffic counts
- Census information - such as journey to work information
- land public transport ridership data from operators
- land public transport operating cost data

8.1.1 Economic Competitiveness

The aim of these indicators is to assess the ridership, capacity of land public transport, the effectiveness of public transport in terms of travel times and access to employment. A key indicator will be the land public transport mode share which will be monitored by different areas in the region. The approach to assessing mode share is through a range of survey methods. These will include:

- Traffic counts across defined cordons and screen lines such as MRR1, MRR2;
- Rail ridership estimation across the same cordons and screen lines from operator data
- Bus ridership estimation across the same cordons and screen lines from operator data and observation surveys

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Requirement</th>
<th>Data Source</th>
</tr>
</thead>
</table>
| Increase Economic Competitiveness & Growth | • Mode  
• Travel Times  
• Service provision & capacity  
• Ridership  
• Employment accessibility | • Counts and ridership data  
• Journey time surveys  
• Operator data  
• Operator data and surveys  
• Model outputs |
| Health, Safety & Security         | • Road casualties  
• Crime rates on land public transport | • Local authority data  
• Police/Operator data |
| Improve Access, Connectivity & Integration | • % people within 400m of a public transport service  
• Customer satisfaction  
• Integration with land use | • Model outputs  
• Customer surveys  
• Development proposal |
| Efficiency & Affordability       | • Mode share  
• Reliability  
• Operating cost  
• Delivery of master plan | • Counts & ridership data  
• Tracking surveys  
• Operator data  
• Completion of measure |
| Equality of Opportunity           | • Fare levels  
• Public transport access indicator (Step free access) | • Fares  
• Composite indicator to be determined |
| Environment                       | • Emissions | • Model outputs |
A rolling programme of household surveys. The travel diaries will be used to provide mode share estimates for all modes including public transport, private vehicle, and motor cycle. Where possible the survey should identify the journey purpose and the time of day for the journey. This travel information will supplement information obtained from the census journey to work survey. It is proposed that the rolling programme is undertaken each year with an appropriate sample to give statistically significant results.

For access to employment the key indicator is the number of jobs within 75 minutes of residents. This will require outputs from the transport model which will need to be updated annually to reflect the latest service patterns. From the model zone to zone travel times can be produced which are assessed using census data by zone to reflect the number of residents. Given that the census data is available every 10 years it is proposed that ‘base year’ data are updated using information from local authorities on the number of completions of household units during the intervening years.

Journey times in the Greater Kuala Lumpur region will be monitored for a series of defined routes. These will include a series of surveys on key corridors to the centre of Kuala Lumpur as well as movements to key outer centres such as between Klang and Shah Alam or to Putrajaya. The number of routes should be defined in a monitoring programme definition. Use should be made of rail timetables to assess rail time. For the bus survey use will be made of GPS units on the vehicle to monitor travel times. For private vehicle a number of journey time observations will be required on selected routes.

Land public transport capacity should reflect the level of service on the network. The capacity can be defined by the frequency of trains and their seating and standing capacity. The collection of rail and bus ridership data from operators can be used to assess the level of over-crowding on the land public transport network to aid the evaluation of passenger comfort.

8.1.2 Health, Safety And Security

Personal safety should be monitored through the number of reported incidents on the land public transport network as well as being assessed through customer satisfaction surveys to assess the perception of safety on the system. A rolling programme of surveys should be undertaken annually to assess any concerns. Use can also be made of any feedback to the SPAD forum.

Accidents can be measured through the number of reported accidents - either by road (including bus and taxi) or by rail. Accidents should be classified according to those involving fatalities, serious injury or others.

8.1.3 Public Transport Accessibility, Connectivity And Integration

Access to the land public transport system can be monitored through the number of people living within 400 metres of a bus or rail network. Given that the census data is available every 10 years it is proposed that ‘base year’ data are updated using information from local authorities on the number of completions of household units during the intervening years. The population data can be compared against the land public transport supply data to assess the catchments served.

Quality of service should be monitored through a rolling programme of customer satisfaction surveys. Separate surveys should be undertaken for each mode identifying the user’s satisfaction with different elements of the land public transport service.
For example, a taxi survey might assess the customer’s reaction to issues such as:

- Charge according to the meter
- Willingness to go to destination
- Service availability
- Call Service
- User’s safety
- Taxi condition
- Drivers’ attitude

Surveys will also be undertaken to assess non-users attitudes to land public transport.

The integration with land use might assess the level of developer contributions obtained from developers and the percentage spent on public transport.

### 8.1.5 Equality Of Opportunity

An Access indicator can be derived which reflects the ease of access to the transport system. Transport for London (TfL) for example, use a composite indicator reflecting accessible bus stops, accessible crossings, and step free stations. This will require an inventory to be undertaken to assess facilities.

A household survey will be able to provide an indication of household income and the amount spent on transport. Annual benchmarking of land public transport fares should be undertaken against comparable cities.

### 8.1.6 Environment

The traffic counts, household surveys and model outputs will allow an assessment of the amount of vehicle kilometres travelled in the region. From this an estimate of emissions will be possible using international best practice.

8.1.4 Efficiency And Affordability

A key feature of the Master Plan will be to introduce some form of performance monitoring of public services in the region. For bus and rail this will need to assess the proposed vehicle kilometres to be operated during the year in comparison with the actual vehicle kilometres served. This will be monitored on a monthly basis to assess trends by route and operator. For the bus survey use will be made of GPS units on the vehicle to monitor travel times and distance covered. The difference between the two values will give an indication of the service reliability and those operators who perform poorly should be penalised. For rail in particular, a performance indicator will be the number of trains arriving within 10 minutes of the scheduled time. This will take into account any cancellations as well as those trains which are delayed.

Key Conclusions

A monitoring programme will be needed to assess the success of the Master Plan

A programme of surveys will be undertaken to assess the performance against a series of indicators which reflect the objectives of the Master Plan
Summary
9 Summary

SPAD has developed the National Land Public Transport Master Plan to set out the vision and direction for land public transport in Malaysia. The purpose is to develop a long term programme to address the current deterioration in land public transport with plans to execute high impact, effective delivery initiatives for 20-years sustainable quality land public transport service for the nation.

The National Land Public Transport Master Plan provides the building blocks for National Land Public Transport policy and a toolkit for the development of Master Plan. The first Regional Master Plan has been developed for the Greater Kuala Lumpur/Klang Valley Region. The region is of key economic importance for Malaysia as a whole.

In order to aid the development of the Master Plan, a series of Guiding Principles have been developed examining issues related to accessibility, capacity, social inclusion and the environment.

Currently land public transport mode share in Greater Kuala Lumpur/Klang Valley is relatively low compared to other major cities and has fallen since the 1980s. This decline is in spite of increased population and households in the region. The fall in land public transport share reflects the increase of the highway network supply; changes in household characteristics such as reducing household sizes; rise in household incomes; affordability of cars; the poor quality of public transport; and the unreliability of buses.

Looking to the future, the public transport network coverage has significant gaps in the rail network even allowing for the committed schemes. These are assessed in terms of land use, travel demand and travel pattern to inform the need for improvements in later stages of the Master Plan development.

The region has seen steady population growth in recent decades which has led to increasing demand for travel. Land public transport mode share in Greater Kuala Lumpur is relatively low compared to other major cities. Current mode share is 16% by land public transport in the region as a whole for the morning peak.

The key concerns for each mode:
• Rail - the capacity of the system and its availability, and the quality of KTM
• Bus - the quality of provision is poor with network coverage and availability leaving large gaps in the network, unreliability of services, their punctuality and the associated waiting times while for operators the viability of services is a challenge. There is currently a general lack of coordinated planning in the provision of bus services. This lack of planning is borne out by the needs of commercial operators to increase revenues and this therefore results in heavy concentration of bus services on key radial routes
• Taxi - the issues relate to quality issues such as the standards of vehicles
There are many areas where land public transport journey times to key destinations are unattractive. Journey times by private vehicle tend to be faster than the equivalent journey by land public transport so that accessibility to jobs by private transport is currently much greater than by land public transport. This leads to increased mode share for cars.

Robust performance monitoring, benchmarking and reporting should be introduced urgently for all rail operators with action plans developed to address and weaknesses identified. It may be possible to improve existing services and performance significantly but in the absence of robust monitoring, benchmarking and reporting, this cannot be assessed with any certainty. An important element of the Master Plan will be to introduce such systems and develop action plans to tackle any weaknesses identified.

Population will continue to grow in the region increasing the demand to travel. Employment intensification is proposed in key centres, particularly the centre of Kuala Lumpur. The employment areas will need good accessibility to maintain the economic status of the region.

The increase in population and employment will increase travel demands. This will put further pressure on the highway network with resulting congestion and unreliable journey times unless public transport capacity and performance improves so as to reduce traffic levels. Land public transport accessibility will be improved along the LRT extension corridors and the MRT extension but overall accessibility will worsen unless additional land public transport supply is provided.

The Master Plan has set out definitions for developing the hierarchies of transport corridors based on primary, secondary, feeder and local/district. The assessment process considers the role of each mode such that the growing travel demand can be met by the appropriate mode.

The range of primary and secondary corridors has been defined for the Greater Kuala Lumpur/Klang Valley Region. The primary corridors focus on the access to the city centre of Kuala Lumpur while secondary corridors focus on orbital movements and the other centres. The volumes of demand in the primary corridors in Greater Kuala Lumpur/Klang Valley justify the provision of high capacity rail services.

The Master Plan includes a series of elements to transform the quality of land public transport in the region:

- A rail strategy has been developed which seeks to maximise the use of the existing KTM network while providing additional capacity in primary and secondary corridors as necessary through the inclusion of new lines and extensions of existing facilities. A phasing strategy has been derived which best serves the needs of the region by identifying those elements for completion by 2020 and 2030.

- A Bus Transformation Plan has been developed, which seeks to deliver an improved network of services; within a regulatory regime which will work for users, operators and public sector entities. The transformation will deliver the standards that the users currently seek; an open and transparent operating environment for operators, as well as contributing to the objectives and policies developed by the government. However, in order to achieve these standards there will be a need for a change in the regulatory regime away from an open market or quality licensing system. In accordance with international best practice, a comprehensive tendering regime based on contracts will secure the services necessary to meet the Plan’s objectives and raise standards.

- For taxi-a number of regulatory changes are required in order to improve the operation of the taxi market. These include improvements in vehicle and driver quality that must be delivered and the enforcement of standards and regulations must be a priority.

At present the provision of interchange between land public transport modes is considered dissatisfactory. No seamless transfer is possible due to physical and ticketing constraints. It is not possible to interchange between rail networks in the Klang Valley without having to first leave the ticket barriers of each individual station. There are however, on-going NKRA UPT initiatives aimed at improving the integration of land public transport system.

The focus of the Master Plan guidance is on multi-modal interchange between one mode of public transport and another land public transport mode. It also considers...
the interchange between public transport and its ‘feeder’ modes for example walking, motorcycle and private car vehicles. The guidance is intended to supplement, rather than replaces, current standards and other legal and discretionary requirements that apply to planning, design and operation of public transport interchanges and should be interpreted in the context of these standards.

In line with the Greater Kuala Lumpur/Klang Valley Master Plan, it is anticipated that there will be additional interchange stations on urban rail network, both between the new lines and the existing lines. This will not only result in more convenient land public transport services for passengers but also create an operationally more efficient and balanced land public transport system.

The Master Plan is supported by measures to enhance land public transport mode share with Land Use policy initiatives and Travel Demand Management.

The Master Plan provides significant benefits in terms of improved accessibility, reduced travel times and integration with land use policy. The enhanced rail network will encourage increased public transport modal share. Overall the Master Plan will assist the economic performance of the region.

The elements of the Master Plan meet the guiding principles through the provision of additional capacity to improve accessibility; capacity and reliability (see Table 9.1). This will allow the region to develop economically.
Consider the planning, integration & co-ordination of all public transport modes

Define modal share targets

Define complementary policies to allow the public transport modal share to achieve the targets

Allow public transport to be socially inclusive to be the mode of choice for all users.

Provide for increased accessibility & connectivity

Take account of the hierarchy of centres; primary centres in particular should be served by rail, where possible to encourage modal transfer

Provide capacity to meet future demands efficiently and reliably to allow the region to grow economically

Provide additional capacity to serve central Kuala Lumpur given its economic importance to the country.

Be based on a process of engagement with stakeholders

Take account of previous studies & plans where appropriate

Seek to provide environmental benefits to the region in terms of noise and air quality

Corridors should be served according to the appropriate mode to meet demands

---

Table 9.1: Comparison of the Master Plan against the Guiding Principles

<table>
<thead>
<tr>
<th>Guiding Principle</th>
<th>Review of Master Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consider the planning, integration &amp; co-ordination of all public transport modes</td>
<td>The approach adopted has developed a corridor based approach to integrating the public transport modes. These elements will be addressed further in the other Subsidiary Plans</td>
</tr>
<tr>
<td>Define modal share targets</td>
<td>Mode share targets to be addressed in the main Master Plan document. The provision of the rail improvements will form a key building block in achieving these.</td>
</tr>
<tr>
<td>Define complementary policies to allow the public transport modal share to achieve the targets</td>
<td>Integration with Land Use Demand Management Policies addressed through the Subsidiary Plans to allow integration of the Master Plan with land use. Stakeholder engagement process is developing these linkages such as Between the URDP &amp; City Plan and Structure Plan</td>
</tr>
<tr>
<td>Allow public transport to be socially inclusive to be the mode of choice for all users.</td>
<td>Wider rail network coverage will increase the catchment areas for rail usage. Good design of the rail network will allow access for all users</td>
</tr>
<tr>
<td>Provide for increased accessibility &amp; connectivity</td>
<td>The improved rail network will increase accessibility and connectivity to and between services</td>
</tr>
<tr>
<td>Take account of the hierarchy of centres; primary centres in particular should be served by rail, where possible to encourage modal transfer</td>
<td>The design of corridors has taken account of the key centres within the region</td>
</tr>
<tr>
<td>Provide capacity to meet future demands efficiently and reliably to allow the region to grow economically</td>
<td>The rail network design matches capacity to demand &amp; will increase accessibility &amp; reduce travel times thus providing benefits to the local economy.</td>
</tr>
<tr>
<td>Provide additional capacity to serve central Kuala Lumpur given its economic importance to the country.</td>
<td>The rail network includes MRT lines to serve the city centre which will increase accessibility &amp; reduce travel time thus providing benefits to the local economy. The expansion of the KTMB capacity will also complement the new lines.</td>
</tr>
<tr>
<td>Be based on a process of engagement with stakeholders</td>
<td>This process is on going through the Master Plan development and will continue through implementation and review</td>
</tr>
<tr>
<td>Take account of previous studies &amp; plans where appropriate</td>
<td>The development of the Master Plan has reviewed previous studies and taken account of the needs of the local authority development plans</td>
</tr>
<tr>
<td>Seek to provide environmental benefits to the region in terms of noise and air quality</td>
<td>The rail network will encourage modal transfer which will reduce car traffic levels allowing improvements to the environment</td>
</tr>
<tr>
<td>Corridors should be served according to the appropriate mode to meet demands</td>
<td>This is achieved through the Master Plan development process</td>
</tr>
</tbody>
</table>
Appendix
## 10 Appendix – List of Initiatives

<table>
<thead>
<tr>
<th>Plan</th>
<th>Initiatives</th>
<th>Detailed programme</th>
<th>Start</th>
<th>End</th>
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<tr>
<td>1.0</td>
<td>URDP</td>
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<tr>
<td>1.1</td>
<td>KTM Komuter Enhancement</td>
<td>Assessment of existing KTM stations</td>
<td>2011</td>
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<tr>
<td></td>
<td></td>
<td>Upgrading of station facilities, access and feeder Services</td>
<td>2011</td>
<td>2014</td>
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<td></td>
<td></td>
<td>Enhancement to signalling, track and power supply</td>
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<td></td>
<td></td>
<td>Delivery of new rolling stocks</td>
<td>2011</td>
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<td></td>
<td></td>
<td>Rebranding as Metro - Improve headway to 5 min on Klang - KL and Seremban - KL, and 7.5 min on KL - Rawang Branch</td>
<td>2015</td>
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<td></td>
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<td>Freight Relief Line</td>
<td>Feasibility Study of Freight Relief Line</td>
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<td></td>
<td></td>
<td>Implementation of Freight Relief Line</td>
<td>2013</td>
<td>2015</td>
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<tr>
<td></td>
<td></td>
<td>Rerouting of freight services away from KL city centre</td>
<td>2015</td>
<td>2016</td>
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<td>1.3</td>
<td>New Urban Rail Lines</td>
<td>Implementation of MRT Line Circle Line Phase 1 - Linking Sentul and Ampang via Bangsar</td>
<td>2013</td>
<td>2020</td>
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<td></td>
<td></td>
<td>Implementation of MRT Line N-S Line Phase 1 - Linking Sentul Pandan Jaya; extension to Selayang, Sg Buloh</td>
<td>2013</td>
<td>2020</td>
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<tr>
<td></td>
<td></td>
<td>Implementation of MRT Line Circle Line Phase 2 - Linking Ampang to Sentul (complete circle)</td>
<td>2024</td>
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<td>Implementation of MRT Line (N-S Line) Phase 2 - Southwards extension to Serdang and Putrajaya</td>
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<td>2030</td>
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<td>Extension to Existing Rail Lines</td>
<td>Implementation of LRT Kelana Jaya line and Ampang line extensions</td>
<td>2011</td>
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<td></td>
<td>Extension of KL Monorail from Tun Sambathan to Taman Gembira</td>
<td>2012</td>
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<tr>
<td>1.5</td>
<td>Longer Term Urban Rail Development</td>
<td>Corridor demand assessment and feasibility study of Putrajaya Monorail</td>
<td>2018</td>
<td>2020</td>
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<td></td>
<td></td>
<td>Implementation of Putrajaya Monorail - Linking Putrajaya Sentral and MRT N-S Line</td>
<td>2021</td>
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<td>Feasibility Study of LRT 3 - Linking Kelana Jaya and Klang</td>
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<td>2020</td>
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<td>Implementation of LRT 3 - Linking Kelana Jaya and Klang</td>
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<td></td>
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<td>Assessment of corridor demand for Outer Orbital Rail Line</td>
<td>2023</td>
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### 2.0 BTP

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<th>Detailed programme</th>
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<td>Developed changes to licensing framework</td>
<td>2011</td>
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<td></td>
<td>Issuance of operator license</td>
<td>2012</td>
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<td></td>
<td>Procurement trial corridor for contract model</td>
<td>2013</td>
<td>2016</td>
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<td></td>
<td>Roll out of Contracting Model</td>
<td>2016</td>
<td>2018</td>
<td></td>
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<td></td>
<td>Procurement of Performance Management System</td>
<td>2011</td>
<td>2011</td>
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<td></td>
<td>Introduction of GPS tracking system for buses</td>
<td>2012</td>
<td>2012</td>
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<td></td>
<td>Roll out of Performance Management system</td>
<td>2012</td>
<td>2016</td>
<td></td>
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<tr>
<td></td>
<td>Development of detailed guidelines and evaluation framework</td>
<td>2011</td>
<td>2012</td>
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<td></td>
<td>Application of guidelines for interchange evaluation and planning</td>
<td>2013</td>
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<td></td>
<td>Development of vehicle specification and standards</td>
<td>2011</td>
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<td></td>
<td>Introduction of annual vehicle testing framework</td>
<td>2012</td>
<td>2013</td>
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<td></td>
<td>Revision of branding and livery policy</td>
<td>2012</td>
<td>2013</td>
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<tr>
<td></td>
<td>Development of driver training scheme</td>
<td>2011</td>
<td>2012</td>
<td></td>
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<tr>
<td></td>
<td>Introduction of training and testing requirement for taxi driver</td>
<td>2012</td>
<td>2013</td>
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<td></td>
<td>Development of Centralised Customer Service Centre</td>
<td>2013</td>
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<td></td>
<td>Implementation of priority lane for use by taxi/bus</td>
<td>2012</td>
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<td></td>
<td>Implementation of multi-agencies cooperation/partnership</td>
<td>2012</td>
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<td></td>
<td>Enforcement of taxi regulations</td>
<td>2011</td>
<td>2013</td>
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<td></td>
<td>Implementation of Industry performance monitoring and target setting</td>
<td>2013</td>
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<td></td>
<td>Development of distance based and time based integrated ticketing</td>
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</table>

# 3.0 Taxi

<table>
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<td>Regulatory Framework</td>
<td>Development of taxi driver, vehicle, and operator database</td>
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<td>3.2</td>
<td>Vehicle Standards</td>
<td>Development of vehicle specification and standards</td>
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<td>2012</td>
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<tr>
<td></td>
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<td>Introduction of annual vehicle testing framework</td>
<td>2011</td>
<td>2012</td>
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<tr>
<td></td>
<td></td>
<td>Revision of branding and livery policy</td>
<td>2012</td>
<td>2013</td>
</tr>
<tr>
<td>3.3</td>
<td>Driver Standards</td>
<td>Development of driver training scheme</td>
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<td>2012</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Introduction of training and testing requirement for taxi driver</td>
<td>2012</td>
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<td>3.4</td>
<td>Integration and Branding</td>
<td>Developed branding - 1 Malaysia Taxi (new vehicle class)</td>
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<td>2012</td>
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<td></td>
<td></td>
<td>Development of Centralised Customer Service Centre</td>
<td>2013</td>
<td>2014</td>
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<td>3.5</td>
<td>Network Reliability and Congestion</td>
<td>Implementation of priority lane for use by taxi/bus</td>
<td>2012</td>
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<td>3.6</td>
<td>Partnership Working</td>
<td>Establishment of multi-agencies cooperation/partnership</td>
<td>2012</td>
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<td>3.7</td>
<td>Performance Management and Enforcement</td>
<td>Enforcement of taxi regulations</td>
<td>2011</td>
<td>2013</td>
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<td></td>
<td></td>
<td>Implementation of Industry performance monitoring and target setting</td>
<td>2013</td>
<td>2014</td>
</tr>
</tbody>
</table>

# 4.0 Interchange & Integration

<table>
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<th>Plan</th>
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<th>Start</th>
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</tr>
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<td>4.1</td>
<td>Interchange Guidance</td>
<td>Development of detailed guidelines and evaluation framework</td>
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<td>2012</td>
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<td>Application of guidelines for interchange evaluation and planning</td>
<td>2013</td>
<td>2014</td>
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<tr>
<td></td>
<td></td>
<td>Implementation of accessibility strategy</td>
<td>Q4 2011</td>
<td>Q2 2012</td>
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<td></td>
<td></td>
<td>Improvement of integration for existing stations</td>
<td>2011</td>
<td>2013</td>
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<td>4.2</td>
<td>Station Integration</td>
<td>Integration with new rail and bus stations</td>
<td>2013</td>
<td>2020</td>
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<tr>
<td></td>
<td></td>
<td>Ticket integration of all PT operators</td>
<td>2011</td>
<td>2013</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Development of distance based and time based integrated ticketing</td>
<td>2014</td>
<td>2016</td>
</tr>
</tbody>
</table>
## 5.0 Land Use Plan

### 5.1 Development Control
- Technical assistance and planning guidance to development control (PT assessment) 2011 - 2012
- Review and extend scope of development control (include PT assessment) 2012 - 2013
- Identify funding incentives to influence planning process to favour LPT provision 2012 - 2013
- Review and extend the scope of development charges and infrastructure service fund (include PT improvements) 2013 - 2015
- Engagement with KL and Selangor local authorities 2012 - 2013
- Development of institutional framework with local authorities 2013 - 2016

### 5.2 Financial Incentives and Contribution
- Improvement of pedestrian and cyclist infrastructure and information 2012 - 2015
- Stakeholder engagement and public awareness on demand management 2013 - 2015
- Review of parking control policies 2013 - 2016
- Review parking charges in city centre and consider workplace parking levy 2016 - 2020
- Review of taxation on new vehicles/fuel duty 2018 - 2020
- Review need for road user charging 2022 - 2024
- Public awareness campaign 2013 - 2015
- Introduce travel plans to major employers and schools 2016 - 2020

**Note:** All projects are subjected to Government’s approval
URBAN RAIL DEVELOPMENT PLAN
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1 Background
1 Background

1.1 Introduction

The URDP is to set the basis for the development of regional rail in the Greater Kuala Lumpur/Klang Valley region. Its purpose is to identify the broad corridors (within a 2.5 km radius) along which any new lines might be developed and to specify measures to enhance the existing rail network. At this stage of the process, it is not for the Greater Kuala Lumpur/Klang Valley Master Plan to set the detailed alignments and station locations. Issues related to these follow this Greater Kuala Lumpur/Klang Valley Master Plan in the Master Plan Execution Phase during examination of the Technical and Financial Feasibility (post September 2011) to be undertaken by SPAD. Similarly the Technical and System Design phase will examine the detailed operational aspects of the plan including the locations of depots. Where appropriate, the development of the URDP has taken account of technical work that has been already undertaken. These elements will be developed further in the master plan execution phases.

The consideration of Inter-City Rail and the role of High Speed Rail will be considered in separate studies undertaken by SPAD.

1.2 Structure Of The Urban Rail Development Plan

This chapter provides a summary of the URDP for the Greater Kuala Lumpur/Klang Valley region. The next chapter outlines the existing situation in the region, particularly with respect to rail. Chapter 3 looks at future conditions including the identification of gaps, assessment of the future land use and travel demands and development of the corridor hierarchy for the region. Chapter 4 identifies the rail proposals while Chapter 5 provides the phasing of measures, the consideration of integration and the review of the benefits of the URDP. Chapter 6 provides an overall summary of the URDP.

This summary document is supported by a technical analysis which will also be available at the publication of the Greater Kuala Lumpur/Klang Valley Master Plan.

Key Conclusions

The URDP is one of six subsidiary plans of the Greater Kuala Lumpur/Klang Valley Master Plan.

The URDP establishes the basis for the development of regional rail in the Greater Kuala Lumpur/Klang Valley region. Its purpose is to identify the broad corridors (within a 2.5 km radius) along which any new lines might be developed and to specify measures to enhance the existing rail network.
Assessment of Current Conditions
Chapter 1: Urban Rail Development Plan

2 ASSESSMENT OF CURRENT CONDITIONS

2.1 Introduction

Chapter 2 provides an outline of the key considerations in the development of the Greater Kuala Lumpur/ Klang Valley Master Plan. The starting point is the understanding of the existing conditions in the Greater Kuala Lumpur/ Klang Valley region in relation to urban rail. This is based on engagement with stakeholders to collate data and identify key problems and issues.

2.2 Key Considerations In Master Plan Development

In developing the Regional Master Plan, processes of 9 stages are undertaken as outlined in Figure 2.1. Having identified the existing situation through analysis of data and stakeholder engagement, a review of the forecast travel situation in the region is identified. The key factors in the assessment are travel demands, including population (and employment), accessibility, travel pattern and travel time. Additionally, other considerations such as network, land use and known technical constraints are assessed (see Figure 2.1). Land use data is assembled from local authorities to reflect future population and employment changes identified in Structural Plans and Local Plans. The Regional Master Plan ensures alignment of state-level public transport plans and the National Land Public Transport Policy, whilst placing importance on inclusion of state-specific requirements. This is achieved through a consultative process and collaboration between state authorities and SPAD in developing the Regional Master Plans. Additionally, the Regional Master Plan recognises the need for consistency between state plan directives and the necessity for public transport. Therefore the Regional Master Plan takes account of the location of major development areas which need to be served by public transport.

Figure 2.1: Key Considerations in the Greater Kuala Lumpur/ Klang Valley Master Plan Assessment
A transport model has been used to assess future travel patterns resulting from the land uses and assuming different network scenarios. The resulting travel time and accessibility patterns have been mapped against the existing situation of urban rail.

A range of time horizons and scenarios have been modelled. These include 2020 and 2030 time horizons and take into account those schemes which are funded and committed, including:

- Ampang Line - extension from Sri Petaling to Putra Heights
- Kelana Jaya Line - extension from Kelana Jaya to Putra Heights
- NKRA initiatives for Keretapi Tanah Melayu (KTMB) - upgrade to 15 minute service per branch.

In addition, MRT1 is being proposed to be constructed between Sungai Buloh and Kajang providing additional capacity in the City Centre with linkages to areas poorly served by public transport such as Damansara and Cheras. This has been assumed in a reference case against which comparisons are made in identifying the further corridor options and the preferred corridors for enhancement.

2.3 Stakeholder Engagement

The initial phase in developing the Greater Kuala Lumpur/Klang Valley Master Plan is to understand current conditions and issues in the Greater Kuala Lumpur/Klang Valley region. As part of the ongoing study, stakeholder engagement with key agencies was used to inform the development of the Greater Kuala Lumpur/Klang Valley Master Plan. The initial engagement included federal agencies, Dewan Bandaraya Kuala Lumpur (DBKL), Selangor State Unit Perancang Ekonomi Negeri (UPEN), Perbadanan Putrajaya, other district local authorities, and transport operators.

From this process SPAD:

- Identified key concerns and issues
- Identified stakeholder’s plans and proposals for the future
- Collated a range of data (land use information, rail patronage, bus network data, traffic counts and journey time data)

The key view points on rail highlighted by stakeholders in relation to the capacity and quality of the existing system, integration between modes particularly the feeder services and gaps in network coverage are presented in Table 2.1. The integration of land use planning and the Greater Kuala Lumpur/Klang Valley Master Plan was raised by DBKL and UPEN with the need to ensure consistency between the plans as a means of matching land public transport proposals with Transit Oriented Developments (TODs). Therefore, the strategy development process needs to ensure consistency between the Greater Kuala Lumpur/Klang Valley Master Plan and City and Structure Plans.

### Table 2.1: Key Viewpoints on Rail from Stakeholders

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Key View Point on Rail: Key Issues and Plans</th>
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<tbody>
<tr>
<td>KTMB</td>
<td>• Conflicts with freight movements&lt;br&gt;• Track capacity constraints at junctions&lt;br&gt;• Quality of existing track and signalling&lt;br&gt;• Poor integration of bus feeder services&lt;br&gt;• Reduce headways through acquisition of new car sets</td>
</tr>
<tr>
<td>SPNB</td>
<td>• Capacity of existing lines&lt;br&gt;• Extend existing LRT lines&lt;br&gt;• Possible extension of LRT to Matrade to serve new convention centre&lt;br&gt;• Upgrade and propose extension of monorail Propose BRT link at Sunway Lagoon</td>
</tr>
<tr>
<td>DBKL</td>
<td>• Ensure Kuala Lumpur 2020 City Plan consistent with SPAD’s Greater Kuala Lumpur/Klang Valley Master Plan&lt;br&gt;• Alignment of MRT1 to match to city plan&lt;br&gt;• Linking transit oriented development (TOD) to future proposed transit corridors&lt;br&gt;• Land Use proposal - city plan to be gazetted later in 2011&lt;br&gt;Review city plan with reference to SPAD’s Greater Kuala Lumpur/Klang Valley Master Plan</td>
</tr>
<tr>
<td>Selangor State EPU</td>
<td>• Review of Selangor State Structure Plan as current plan is based on research in 2003. This will allow local authorities to update their Local Plan&lt;br&gt;• Alignment of MRT1 &amp; match to local and structure Plans&lt;br&gt;• Link TODs to future proposed corridors&lt;br&gt;• Review Structure Plan</td>
</tr>
</tbody>
</table>
2.4 Demographics

The 2010 census identified a regional population of 6.3 million compared with 4.6 million in 2000 and 3.0 million in 1990 (see Table 2.2). Although the percentage change at 37% from 2000 to 2010 is lower than in the previous decade, the magnitude of change is similar with an additional 1.7 million people in the region during the decade. The largest percentage growth is to the south and west of Kuala Lumpur in districts such as Sepang, Petaling Jaya and Putrajaya. The magnitude of growth in Kuala Lumpur between 2000 and 2010 was also higher than the previous decade (320,000 compared to 160,000).

The number of households has grown by 59% in the last decade with the total number of households in the region being 1.66 million households. The net result of these changes is that the average household size has fallen from 4.81 persons per household in 1991 to 4.46 in 2000 and 3.83 in 2010. These changes seen in all districts across the study area and has contributed to the increase of travel demands.

Table 2.2: Population and Household Trends

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<tbody>
<tr>
<td>Selangor districts in study area</td>
<td></td>
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<tr>
<td>Gombak</td>
<td>352,649</td>
<td>537,525</td>
<td>682,996</td>
<td>52%</td>
<td>27%</td>
<td>72,781</td>
<td>115,475</td>
</tr>
<tr>
<td>Klang</td>
<td>406,994</td>
<td>643,436</td>
<td>848,149</td>
<td>58%</td>
<td>32%</td>
<td>77,878</td>
<td>165,327</td>
</tr>
<tr>
<td>Petaling</td>
<td>633,165</td>
<td>1,184,180</td>
<td>1,782,375</td>
<td>87%</td>
<td>51%</td>
<td>132,230</td>
<td>268,287</td>
</tr>
<tr>
<td>Sepang</td>
<td>48,941</td>
<td>97,139</td>
<td>212,050</td>
<td>98%</td>
<td>118%</td>
<td>9,504</td>
<td>18,952</td>
</tr>
<tr>
<td>Ulu Langat</td>
<td>413,900</td>
<td>864,451</td>
<td>1,141,880</td>
<td>109%</td>
<td>32%</td>
<td>87,285</td>
<td>193,765</td>
</tr>
<tr>
<td>Selangor sub total</td>
<td>1,855,649</td>
<td>3,326,731</td>
<td>4,667,450</td>
<td>79%</td>
<td>40%</td>
<td>379,678</td>
<td>731,806</td>
</tr>
<tr>
<td>WP Kuala Lumpur</td>
<td>1,145,342</td>
<td>1,305,792</td>
<td>1,627,172</td>
<td>14%</td>
<td>25%</td>
<td>224,267</td>
<td>308,006</td>
</tr>
<tr>
<td>WP Putrajaya</td>
<td>5,730</td>
<td>11,501</td>
<td>67,964</td>
<td>101%</td>
<td>491%</td>
<td>1,022</td>
<td>2,152</td>
</tr>
<tr>
<td>Greater Kuala Lumpur/Klang Valley</td>
<td>3,006,721</td>
<td>4,644,024</td>
<td>6,362,586</td>
<td>54%</td>
<td>37%</td>
<td>624,967</td>
<td>1,041,964</td>
</tr>
<tr>
<td>Selangor districts outside study area</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kuala Langat</td>
<td>130,090</td>
<td>192,176</td>
<td>222,261</td>
<td>48%</td>
<td>16%</td>
<td>24,388</td>
<td>38,309</td>
</tr>
<tr>
<td>Kuala Selangor</td>
<td>123,052</td>
<td>161,168</td>
<td>210,406</td>
<td>31%</td>
<td>31%</td>
<td>23,618</td>
<td>32,455</td>
</tr>
<tr>
<td>Sabak Bernam</td>
<td>99,824</td>
<td>113,245</td>
<td>106,158</td>
<td>13%</td>
<td>6%</td>
<td>20,122</td>
<td>24,258</td>
</tr>
<tr>
<td>Ulu Selangor</td>
<td>82,814</td>
<td>147,996</td>
<td>205,049</td>
<td>79%</td>
<td>39%</td>
<td>17,314</td>
<td>32,464</td>
</tr>
<tr>
<td>Selangor</td>
<td>2,291,429</td>
<td>3,941,316</td>
<td>5,411,324</td>
<td>72%</td>
<td>37%</td>
<td>465,120</td>
<td>859,292</td>
</tr>
</tbody>
</table>

(Source: Census 2010)
The resulting population and employment densities have been mapped and show the higher population densities are in the main suburbs of Kuala Lumpur and the regional centres such as Shah Alam, Klang and Petaling Jaya (see Figure 2.2). For employment the greatest concentrations of employment are in the city centre of Kuala Lumpur. Recent trends have highlighted the increasing concentration of employment in the major centres which has implications for the choice of appropriate modes to serve these centres. Where the concentrations of demands are highest are those locations where rail is most effective to provide the transport mode.

Figure 2.2: Population and Employment Densities 2010
2.5 Network Provision

The current public transport network in the region covers 278km of rail with 115 stations (see Figure 2.3 and Table 2.3). In addition there is an extensive bus network operated by Rapid Kuala Lumpur, Metrobus and a number of smaller operators.

Table 2.3: Existing Rail Network

<table>
<thead>
<tr>
<th>Rail Line</th>
<th>General Rail Category</th>
<th>Route Length</th>
<th>No. of Station</th>
<th>Peak Hour Headway</th>
</tr>
</thead>
<tbody>
<tr>
<td>KTMB Komuter</td>
<td>Suburban Rail</td>
<td>157km</td>
<td>50 Stations</td>
<td>15 min</td>
</tr>
<tr>
<td>Kelana Jaya (Putra LRT1)</td>
<td>Urban Rail/ Metro</td>
<td>29km</td>
<td>24 Stations</td>
<td>3 min</td>
</tr>
<tr>
<td>Ampang (Star) LRT2</td>
<td>Urban Rail/ Metro</td>
<td>27km</td>
<td>25 Stations</td>
<td>3-6 min</td>
</tr>
<tr>
<td>Monorail</td>
<td>Urban Rail/ Metro</td>
<td>8.6km</td>
<td>11 Stations</td>
<td>5 min</td>
</tr>
<tr>
<td>KLIA</td>
<td>Suburban Rail/ Airport Express</td>
<td>57km</td>
<td>5 Stations</td>
<td>15 min</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>278.6km</td>
<td>115 Stations</td>
<td></td>
</tr>
</tbody>
</table>

(Source: Prasarana, KTMB)

Figure 2.3: Existing Public Transport Network (Source: Halcrow)
Chapter 1: Urban Rail Development Plan

The KTMB Komuter runs on rail corridors that are the oldest in the country. In the early 1990s freight and passenger railway tracks between Port Klang, Sentul, Rawang and Seremban were upgraded and electrified. It was opened as the KTMB Komuter system in 1995. Since then there have been extensions to Tanjung Malim, Batu Caves and Seremban to Sungai Gadut. The current system is operated by Keretapi Tanah Melayu Berhad (KTMB). The Ampang Line (formerly STAR) was built of grade separated tracks using a combination of new alignments and the utilisation of disused freight rail lines from Pudu to Ampang. The first phase of the system opened in December 1995 and fully operational in December 1998. The system is currently operated by Rapid Kuala Lumpur. The Kelana Jaya line opened in 1998 as the Putra LRT using a completely new grade separated alignment. The Kuala Lumpur monorail opened in 2003 and links areas within the centre of Kuala Lumpur that were not served by the other urban rail systems.

The current daily ridership on the urban rail network is over 464,000 passengers per day with the Kelana Jaya and Ampang LRT services having the highest passenger loads. Data provided by the rail operating companies shows that the busiest stations include the main interchanges such as Masjid Jamek and Kuala Lumpur Sentral. Typically KTMB is being used for longer distance movements including locations outside the Greater Kuala Lumpur/ Klang Valley region such as Seremban. Of 50 KTMB Komuter stations in the region, 12 have less than 250 passengers per day. This reflects the inaccessibility from the surrounding areas as well as the low frequency and slow journey times on KTMB. This highlights a need to provide improvements to the KTMB services.

2.6 Travel Demands

Feedback from stakeholders indicates that the mode share of car has been increasing in recent decades. The morning peak modal share for land public transport has fallen from 34% in the 1980’s to 10-12% in 2008 (Source: NKRA). This share is relatively low compared to other international cities such as Hong Kong (90% by land public transport), Singapore (63%), and London (55% by land public transport). This reduction in land public transport reflects the:

- Increase of the highway network supply
- Changes in household characteristics such as reducing household sizes
- Rise in household incomes
- Affordability of cars
- Poor quality of public transport (specifically the unreliability of buses).

The net result of increased car use has been a rise in congestion across the region. However travel times for private vehicles remain competitive against the use of public transport. Buses are also subject to the congestion given the lack of bus priority measures. Figure 2.4 compares the perceived travel times to KLCC by car and public transport from all other areas in the region. Those areas shown in blue have the lowest travel time while those in red have the longer travel time. These perceived times are based on door to door time and for a land public transport journey include elements of walking time at both the origin and destination, waiting time, in-vehicle time, and interchange time. In the perceived time calculation a weighting is applied reflecting the passengers valuation of the different elements such that walking and waiting has a weight of 2.0 compared to in-vehicle time (weight =1). Travel time are typically much higher by public transport resulting in poorer accessibility to jobs and facilities. The figures show that travel time by car are typically shorter than by land public transport for many journeys in the region. The exception is those corridors currently well served by rail such as the LRT corridors.
Accessibility by public transport is an important factor of the Greater Kuala Lumpur/Klang Valley Master Plan. Accessibility has been mapped from both perspectives of employers and residents across the region. Figure 2.5 shows the accessibility indicator from the employer’s perspective and indicates for any location, the number of employees within 75 minutes of those jobs by using land public transport. The blue areas on the map are those areas with the greatest accessibility and where employers have a much larger pool of labour to attract within 75 minutes. The pink areas are those with much lower attractiveness as they have lower numbers of workers available within their catchment. The diagram has screened out those in white which do not have significant employment in them.

Typically the more accessible areas by land public transport reflect the rail corridors within Kuala Lumpur. Within the central area of Kuala Lumpur there is a strong focus on the LRT corridors. The map does show that areas to the north and west of the region generally have less accessibility than to the south. Therefore for land public transport, only those employers close to a rail or LRT line have good access to the workforce and similarly those residents living close to such lines have greater access to employment by land public transport.
2.7 Service Reliability And Efficiency

Maximising the reliability of existing systems can help enhance both their attractiveness and increase capacity. Each train cancelled or delayed will undermine the attraction of the service and reduce capacity. Indeed often it is the uncertainty of unreliable services that deters users more than the actual frequency or journey time.

Similarly, poor efficiency will be likely to result in poorer overall service quality (and potentially volume), the need for higher fares than necessary as well as worse financial results.

It has not been possible to establish clear benchmarks of existing performance of the rail operators, but one focus of the rail plan must be to ensure that all operators are providing as efficient and reliable services as reasonably practicable.

In the absence of monitoring and benchmarking information it is impossible to judge whether the operators are providing the best possible services at the best value. The lack of robust monitoring also makes it difficult to put complaints into context.

The conclusion is that a system of robust monitoring, benchmarking and reporting needs to be put into place for all rail operations. Should this identify weaknesses (including the use of reasonable comparator systems) then action plans need to be developed to address these weaknesses and to ensure that they are not replicated in the design and planned operation of system enhancements, extensions and new lines.
Key Conclusions

The region has seen steady population growth in recent decades which has led to increasing demand for travel.

Land public transport mode share in Greater Kuala Lumpur/Klang Valley is relatively low compared to other major cities.

There are many areas where land public transport journey times to key destinations are unattractive.

Journey times by private vehicle tend to be faster than the equivalent journey by land public transport.

Accessibility to jobs by private transport is currently much greater than by land public transport.

The poorer accessibility by land public transport leads to increased mode share for cars.

Robust performance monitoring, benchmarking and reporting should be introduced urgently for all rail operators with action plans developed to address and weaknesses identified.
LOOKING TO THE FUTURE OF RAIL
3.1 Introduction

This chapter outlines the process for collating future information regarding the situation in Greater Kuala Lumpur/Klang Valley. The scenarios considered have taken account of the transit gaps and the future land use patterns identified by the local authorities. The impact of land use is considered in terms of population and employment and how this impacts upon travel demands. The transport analysis tools assess the future travel patterns and demands particularly along the corridors in the Greater Kuala Lumpur/Klang Valley region. These are compared against a corridor hierarchy based on peak passengers per hour per direction (PPHPD). The tools provide methodologies to assess the impacts of alternative options within and between corridors. From this basis, preferred corridors were identified and the proposals for the URDP assembled.

3.2 Identifying The Rail Gaps

The committed future rail network was plotted to identify those gaps which are potentially poorly served by land public transport (see Figure 3.1) whilst having significant population or employment centres that might justify rail access. The gaps are defined as being beyond 2.5km from the rail lines. The network used for this assessment assumes the LRT extensions to Putra Heights as well as the completion of MRT1 between Sungai Buloh and Kajang.

The brown sectors depict the rail transit gaps (or white areas where rail is not easily accessible to the commuters) based on the proposed future rail network including MRT1 and the LRT extensions. Within Kuala Lumpur these include a number of suburbs such as Pandan, Mont Kiara, and Serdang which fall within rail gaps. In Selangor the rail network gaps include Cyberjaya, areas to the north and south of Klang and Shah Alam, and Selayang. Most of Putrajaya currently lies within a rail gap as the services operate to Putrajaya Sentral which is to the west of the city.

The next stages in the Greater Kuala Lumpur/Klang Valley Master Plan development assessed the changes in future land use in these areas and the resulting travel demands and travel patterns created to assess future transport needs and whether these should be filled by rail or other modes.

The analysis of the rail transit gaps highlight weaknesses that need to be reviewed through the Greater Kuala Lumpur/Klang Valley Master Plan. Given the importance of the region to the national economy there is a need to increase accessibility to the primary centres and key employment areas. These include the centre of Kuala Lumpur where employment intensification is a key feature of the DBKL City Plan. Other centres such as Shah Alam and Putrajaya are also higher density employment locations. These will rely on the provision of enhanced land public transport to serve these centres, both from radial and orbital perspectives. While there is an extensive bus network in place, there are still gaps without high quality reliable public transport links and from which journey times are slow.
The gaps highlight the need to provide better land public transport services to serve key future developments identified by the local authorities. Generating the intensity of demand within these gaps to justify rail investment would be greatly helped through TODs. These developments will provide a greater incentive for public transport use by their co-location to transit nodes. The gaps indicate those existing populated areas and future developments that are not served by rail and therefore provide the pre-requisite consideration for rail services subject to other considerations such as demand. The gaps also indicate the need to improve modal integration for passengers to be able to use bus and rail services to access key centres.

Key Conclusions

The land public transport network coverage has rail gaps even allowing for the committed schemes. These are assessed in terms of land use, travel demand and travel pattern to inform the need for improvements in subsequent development stages of the Greater Kuala Lumpur/ Klang Valley Master Plan.
3.3 Future Land Use Demands

Data have been collated from the local authorities in relation to the Kuala Lumpur City Plan, the Selangor State Structure Plan, Putrajaya Master Plan and district local plans. The latest versions of the plans have been reviewed to identify their data, land use policies and development proposals. From this basis, the transport recommendations of the Greater Kuala Lumpur/Klang Valley Master Plan are developed using an independent systematic and methodological approach as outlined in this chapter. This allows consistency and integration of the land public transport elements of the Greater Kuala Lumpur/Klang Valley Master Plan with the development aspirations of the land use plans.

The population forecasts assume a capacity of 10 million people in the region with the largest growth forecast in Klang, Sepang and Putrajaya. This is a 59% increase in population compared to 2010. The population density map for 2020 (see Figure 3.2) is similar to that shown earlier for 2010 with higher densities in the main suburbs of Kuala Lumpur and the regional centres such as Shah Alam. There are a number of major residential developments proposed within the land use plans which need to be incorporated into the Greater Kuala Lumpur/Klang Valley Master Plan. The household size projections within the plans are forecast to drop further to 3.93 persons per household in 2020. This growth will maintain the pressure on the transport networks with increased demand for movement across the region.

Figure 3.2: Population and Employment Densities 2020
The draft DBKL City Plan forecasts the growth in jobs from 729,000 in 2005 to 1.2 million in 2010 and 1.4 million in 2020. The City Plan shows greater intensification particularly in the city centre. There are a number of major commercial developments within the land use plans which need to be integrated into the Land Public Transport Master Plan (such as Tun Razak Exchange (TRX) and Matrade). The growth in these locations will intensify the need for high capacity public transport for their own success and to maintain the economic status of the region. In particular, enhanced rail systems need to provide access to the centre of Kuala Lumpur.

Key Conclusions
Population will continue to grow in the region increasing the demand to travel.
Employment intensification is proposed in key centres, particularly the centre of Kuala Lumpur.
The concentration of employment will be more and more difficult to serve without major increases in land public transport mode share.
Employment areas will need good accessibility to maintain the economic status of the region.

3.4 Future Travel Demands
The transport analysis tools have been developed for use by SPAD in assessing the key considerations of land use and transport schemes on future travel demands, travel time and accessibility. The tools include:

- A Land Use database which utilises the data provided by DBKL, Selangor UPEN and Perbadanan Putrajaya
- A trip generation model which uses the land use information to derive the forecast travel demands in the region
- A multi-modal transport model which derives the future travel patterns on the network in terms of flows, and travel time
- An accessibility model which shows the impact of travel time on access to locations within the study area for catchment area analysis
- Forecasts have been produced for the morning peak 2020 situation with those committed schemes and the MRT1. The forecast morning peak hour travel demands by all modes (private and public transport) in the region show large radial movements towards the central area of Kuala Lumpur (see Figure 3.3). Demand for all modes crossing the MRR1 as forecast for 2020 shows strong flows in all the corridors with the highest demands being from the Petaling Jaya/ Shah Alam/ Klang corridor.

Within the region there are also strong orbital demands in the suburban areas (see Figure 3.4), particularly to areas such as Petaling Jaya and Shah Alam. The largest flows are in the Petaling Jaya area along corridors such as the North-South Expressway and the Damansara-Puchong Expressway (LDP) corridor. In addition to these flows between centres, there is a wide diversity of local movements within the suburban areas such as local movements within Shah Alam or Klang. Although lower than the radial demands into the centre of Kuala Lumpur, these demands require high quality land public transport access.
Figure 3.3: Forecast Travel Demands towards Kuala Lumpur Central Area (AM Peak Hour)

Figure 3.4: Forecast Travel Demands Orbital Movements (Morning Peak Hour)
Without improved land public transport and a mode shift to land public transport, the net result of the growth in travel demands arising from the land use changes will further increase car usage. This will lead to longer travel time with a further significant rise in congestion for private vehicles, as well as buses leading to unreliable travel time. This will affect the commercial performance of the region. The forecast 2020 travel time to the centre of Kuala Lumpur clearly show the lengthening of private vehicle journey time with more areas in red (see Figure 3.5) and much fewer areas of blue.

A similar comparison for public transport shows travel time will improve along those corridors with the Commitments (more green areas). These include the LRT extensions to Putra Heights (see Figure 3.6) as well as the MRT1 line through Damansara and Cheras.

Figure 3.5: Modelled Perceived Travel time by Private Vehicle to KLCC  
(Source: Greater Kuala Lumpur Transport Model)
Mapping overall accessibility to employment shows a much wider area of blue with improved accessibility (see Figure 3.7). The areas of improvement follow the LRT extensions and the MRT1 line through areas such as Damansara, Cheras and Kajang. However, the figure does confirm that significant gaps remain such as Mont Kiara and along the Klang corridor and that the committed schemes alone do not provide high quality land public transport services to all parts of the region. The conclusion is that further land public transport measures are needed.

Figure 3.6: Modelled Perceived Travel time by Public Transport to KLCC
(Source: Greater Kuala Lumpur Transport Model)

Figure 3.7: Modelled Accessibility Index 2020
(Source Greater Kuala Lumpur Transport Model)
Key Conclusion

The increase in population and employment will increase travel demands.

This will put further pressure on the highway network with resulting congestion and unreliable journey times.

Land public transport accessibility is improved along the LRT extension corridors and the MRT extension, but significant areas remain without good accessibility.

Overall accessibility will worsen unless additional land public transport supply is provided.

3.5 Corridor Hierarchy

The approach to the Greater Kuala Lumpur/Klang Valley Master Plan development is to investigate the corridor hierarchy in a region and from this to select the appropriate modes where enhancement is needed. Four levels of corridor are identified according to the Planning Guidelines including primary, secondary, feeder and local/ district corridors. In the context of Greater Kuala Lumpur/Klang Valley, these are distinguished within a functional hierarchy and are based on PPHPD (see Figure 3.8).

The conceptual diagram of how the corridors fit together shows that at the top level of the hierarchy are the primary corridors. These are identified as corridors with the highest demand (over 25,000 PPHPD). These will typically be linkages to city centres potentially

![Figure 3.8: Conceptual Corridor Hierarchy](image)
from other suburban town centres. At these levels of demand, high quality rail-based systems are likely to be justified. Transit stops along the primary corridors will be further apart than on other corridors reflecting the need to serve the city centre. Each transit stop would be served by a walking catchment (potentially up to 400 metres if outdoors and over 400 metres if indoors or under cover). Transit stops would also be supported by a feeder bus network.

Secondary corridors can serve a range of functions such as lower demand corridors to a city centre or as providing linkages to a primary corridor. They will have demands in the range 5,000 to 25,000 PPHPD. In these corridors demand will, in some cases, be sufficient to justify rail-based systems while in others a high quality bus solution may be more appropriate. Transit stops might be closer together on the secondary corridors served and walking and bus catchments.

The feeder services are crucial to support the primary and secondary corridors as these provide access to the main services. Finally there are local corridors which access other local centres as these will generate demands in their own right. Feeder services and local corridors are likely to be bus based, with the maximum practicable priority to minimise journey times and unreliability. The role of bus in the Greater Kuala Lumpur/Klang Valley Region is outlined in more detail in the Bus Transformation Plan document.

3.6 The Greater Kuala Lumpur/ Klang Valley Corridor Hierarchy

The corridors in the Greater Kuala Lumpur/Klang Valley have been identified in terms of their roles in the hierarchy. The forecast demands identified in Section 3.4 were based on all modes (private and public transport) for each corridor. The morning peak demands were converted to a land public transport PPHPD which assumes a 50:50 split between public transport and private transport reflecting longer term aspirations for modal share in the region. It is noted that for some corridors a higher modal share will be achievable.

The primary corridors cover each of the main entries into the city centre of Kuala Lumpur (see Figure 3.9). Rail provides the main mode in the majority of these corridors. The KTMB network provides services from the Klang, Sungai Buloh/Rawang corridors and for part of the Selayang corridor from Batu Caves. LRT1 provides the main mode in the Gombak corridor while LRT2 serves the Selayang and Ampang corridors. Both LRT lines serve the Subang/Puchong corridor through their extensions to Putra Heights. This fills one of the current rail gaps. The southern corridor towards Putrajaya is served by KTMB and ERL. The new MRT1 line will provide the main mode in the corridor from the CPA to Kota Damansara and Kajang (via Cheras) as well as linking Kota Damansara to Sungai Buloh. The MRT1 line therefore closes some of the key gaps in the rail network.

Key Conclusion

The Greater Kuala Lumpur/Klang Valley Master Plan has set out definitions for developing the hierarchies of transport corridors based on primary, secondary, feeder and local/district corridors.
The secondary corridors comprise the linkages to other key centres such as Klang, Shah Alam, Petaling Jaya and Putrajaya. Additionally the secondary corridors include a number of orbital movements around Kuala Lumpur. There is an inner orbital corridor around the city linking locations such as Mont Kiara, Mid Valley Megamall and Sentul. An outer corridor can be identified linking Gombak, Selayang, Kota Damansara and Pandan. The demands in these corridors often reflect the road system with the LDP corridor and North-South (N-S) Expressway corridors having high demands. Looking at the future land public transport network these corridors would be served by modes appropriate to the local circumstances. In some cases these will require rail systems while for others monorail, tram or bus would be appropriate.

In addition to the primary and secondary corridors there are extensive feeder and local/district corridors which are shorter in length and provide local access to centres and the other corridors. These are served by the bus network.

In the case of Kuala Lumpur, the assessment process showed that meeting the growing travel demand can be best achieved through a combination of solutions most appropriate to the needs of the individual corridors and areas served.
Key Conclusion
The range of primary and secondary corridors has been defined for the Greater Kuala Lumpur/Klang Valley region.
Primary corridors focus on the access to the city centre of Kuala Lumpur.
Secondary corridors focus on orbital movements and the other centres.
The assessment process needs to consider the role of each mode such that the growing travel demand can be met by the appropriate mode.
4 APPRAISING RAIL CORRIDORS
4 APPRAISING RAIL CORRIDORS

4.1 Introduction

The previous chapter highlighted the future land use changes in terms of population and employment and how these would influence travel patterns in the region. The travel patterns show a strong indicator of movement to the primary centres, particularly to the central area of Kuala Lumpur. This intensifies the need to provide greater capacity on these corridors to cope with the demands. In addition, good station access in the central area is important in order to disperse demands across a number of access points to avoid overloading the system at a small number of key terminals or interchanges. This chapter outlines the rail proposals within the URDP. Although there is a need to maximise reliability and efficiency of the existing operations, the scale of the need for additional capacity and the gaps in the current networks mean that this should be one part of the plan, albeit an important one.

![Figure 4.1: Relating the Modes to Conceptual Corridor Hierarchy](image)
4.2 Modes

Land public transport covers a wide range of modes from different types of bus and rail systems. Each has different key characteristics in terms of PPHPD, average speed, technology and operating considerations. Buses typically operate at lower speeds and are more likely to be subject to congestion thus impacting on their reliability and ability to operate to timetable. There is often the potential to implement priority measures and buses provide the greatest flexibility to respond to changes in demand and network characteristics. They provide a much lower capacity compared to rail systems but do operate with lower costs where lower capacity is required. As such buses are more suited to feeder corridors and local/district network.

BRT systems can operate with a range of vehicle types from single deck buses carrying 70 passengers up to articulated vehicles carrying 300 of which the majority will be standing. These rely more on segregated sections of carriageway in order to provide relief from congestion. They can play a role in local corridors and also on secondary corridors. The capacity provided is a function of the headway and vehicle types. This will determine the amount of carriageway required for BRT services. High frequency services, such as in Latin America, typically require more running lanes so that with transit stations, they can require the equivalent of a 5 lanes highway and are thus very demanding of infrastructure needs.

Street trams by comparison can operate within traffic lanes or segregated from traffic and are extensively used in Western Europe. Where they operate with traffic and pedestrians, the speed is lower and can be subject to delay. In developing a network, as the system is at grade, there may be significant disruption to utilities during construction to avoid operational disruption. The capacity of tram systems is not as large as for a monorail due to operational characteristics but the infrastructure costs are lower.

Monorail also provides an overlap between local feeder and secondary corridors. These systems can provide similar levels of capacity to BRT and are segregated from traffic using elevated sections. They require sophisticated signal and control systems to operate at high frequency. Monorail systems have limited interoperability and it is not easy to switch tracks as with conventional rail systems.

Rail systems can be envisaged as providing linkages to the city centre, particularly through primary and secondary corridors in Greater Kuala Lumpur/Klang Valley. They offer advantages in that they are the main mode most likely to encourage modal transfer from private vehicles. They also allow local authorities to encourage TODs in the corridor. Therefore primary corridors are characterised as being most appropriate for heavy rail, MRT and LRT systems. MRT will operate with a higher capacity than LRT systems but will be the most expensive to implement. LRT can provide lower capacity and cost services including providing access to secondary centres. Where elevated sections are provided these can have a relatively high visual impact.

In many major cities rail is seen as the primary mode for high capacity corridors, particularly for city centres.

In developing a Greater Kuala Lumpur/Klang Valley Master Plan, the role of each mode needs careful consideration according to the local requirements.

Key Conclusion

The assessment process needs to consider the role of each mode such that the growing travel demand can be met by the appropriate mode.

In the case of Kuala Lumpur, the assessment process showed that meeting the growing travel demand can be best achieved through a combination of solutions most appropriate to the needs of the individual corridors and areas served.
4.3 Developing The Corridors In The Future - Assessing The Demands

An assessment has been undertaken to review whether the proposed supply can accommodate the forecast 2020 travel demands and meet the aspirations of higher land public transport modal share. The initial analysis examined a scenario with no additional improvements over the committed LRT extensions and the MRT1 line. This showed that the MRT1 corridor and the LRT1 corridors are forecast to operate in the morning peak within capacity (see Figure 4.2). The corridors to the city centre from Selayang, Klang, Ampang and Putrajaya are forecast to have demands in excess of supply while those from Sungai Buloh and Pandan are forecast to have demands significantly over supply. In the case of Pandan there is no direct rail link from this area to the city centre so the bus network is overloaded.

The analysis concluded that currently funded rail projects will not be sufficient to meet the forecast growth in travel demand given the intensification of employment in the CPA. The introduction of the MRT1 and the LRT extensions will improve conditions in key corridors but further measures are required to enhance land public transport modal shares and provide greater comfort and reliable journeys. The impact of a congested Greater Kuala Lumpur/Klang Valley region is likely to have economic consequences given the importance to the national economy.

Therefore the challenge is to provide an enhanced public transport system which can encourage modal transfer and reduce overcrowding by providing more capacity particularly in the peak periods. This will need greater emphasis on the role of both bus and rail. The implication for rail is that it will not only require additional infrastructure but will also need greater station capacity, rolling stock, maintenance depots and power supply.

![Figure 4.2: Forecast Over-crowding on the Primary Corridors](WJD005758 Greater KL BI.indd)
4.4 Summary Of The Rail Proposals

This section summarises the rail proposals included in the URDP. A more detailed explanation is given in Section 4.5 for each element. The purpose of the URDP is to define broad corridors where new and enhanced lines are needed in addition to existing commitments. In line with the guiding principles the rationale behind these are to:

- Maximise the potential use of the current assets and the quality of service
- Provide an expansion of capacity to cope with demands through extensions
- Construct new lines to meet demand and future developments

Pertaining to implementation of rail proposals included in the URDP, a more detailed technical assessment will be required of the engineering and operational feasibility. That stage will examine the exact alignment that should be adopted for new lines and the location of stations.

In order to identify these proposals an initial technical analysis was undertaken using the transport analysis tools to assess ridership and accessibility which sought to compare alternative options for individual corridors, or between providing new lines in alternative corridors.

As part of the Greater Kuala Lumpur/Klang Valley Master Plan the proposed rail enhancements to the primary corridors include:

- Upgrade of the KTMB service between Klang and Kuala Lumpur Sentral to provide a ‘metro’ style service
- Upgrade of the KTMB service between Seremban and Rawang/Batu Caves to provide a ‘metro’ style service;
- Provision of a new MRT Circle line around Kuala Lumpur
- Provision of a new north west-south east MRT line to serve the city centre
- Development of an LRT line to operate between Kelana Jaya LRT, Shah Alam and Klang

The proposed rail enhancements to the secondary corridors include:

- Extension of the Kuala Lumpur Monorail
- Completion of the Putrajaya Monorail
- Development of an outer orbital route linking suburban centres

Figure 4.3 shows the development of the primary corridors up to 2020. Given the intensification of employment in the city centre, the emphasis is to develop the linkages to the central area of Kuala Lumpur by providing additional capacity on the radial routes through the upgrade of KTMB, and to the eastern half of the city centre passing major new development areas such as Kampung Baru by the provision of a new MRT line. In addition, the provision of a Circle Line will link major development areas in accordance with the DBKL City Plan.

Figure 4.4 shows the 2030 development of the primary corridors with the extension of the North-South MRT line towards Putrajaya and the provision of a local LRT spur line between Kelana Jaya and Klang via Shah Alam. This would operate in parallel with the KTMB service to Klang but as far as practicable with a separate complementary catchment area.
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Figure 4.3: 2020 Development of the Primary Corridors

Figure 4.4: 2030 Developments of the Primary Corridors

Rail Improvements in the Corridors:
- Upgrade of the KTM service between Klang - KL Sentral to provide a ‘metro’ style service.
- Upgrade of the KTM service between Seremban - Rawang/ Batu Caves to provide a ‘metro’ style service.
- Provision of a new MRT Circle line around KL.
- Provision of a new north-south MRT line to serve the city centre.

Future extension / new lines in the Corridors:
- Klang - Reliant Jaya LRT
- North-south MRT line to serve the city centre.
- Extension North-south MRT line to serve the city centre.
- Committed Kg. Buloh - Kajang Line
Rail improvements to the secondary corridors are shown in Figure 4.5. These include the extension of the Kuala Lumpur Monorail and completion of the Putrajaya Monorail. In the longer term there is a need to provide some form of orbital relief along the LDP corridor. The sections through Petaling Jaya have particularly heavy private vehicle demands resulting in significant congestion. Initially consideration should be given to the bus network coverage in this area but in the longer term additional capacity will be needed to link areas such as Gombak and Damansara to Petaling Jaya. An outer orbital LRT line should be considered by 2030.

Improvements in the remaining secondary corridors will be provided by using bus and BRT. These corridors will be outlined in the BTP.

Figure 4.5: Development of the Secondary Corridors-Rail
Table 4.1 provides a summary of the rationale for each element. These are outlined in more detail in the next section.

Table 4.1: Rationale for the Rail Proposals

<table>
<thead>
<tr>
<th>Scheme</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Klang Kuala Lumpur Sentral KTMB line</td>
<td>Upgrade of KTMB services to enhance service quality, frequency and journey time. The proposal seeks to make optimum use of KTMB to provide greater capacity on radial corridors</td>
</tr>
<tr>
<td>Seremban - Kuala Lumpur Sentral KTMB line</td>
<td></td>
</tr>
<tr>
<td>Rawang - Kuala Lumpur Sentral KTMB line</td>
<td></td>
</tr>
<tr>
<td>Batu Caves - Kuala Lumpur Sentral KTMB line</td>
<td></td>
</tr>
<tr>
<td>Freight Relief Line</td>
<td>In order to assist the commuter service upgrade to KTMB, a freight relief line is proposed to link Klang with the N-S line. The aim is to allow greater capacity to be provided for passenger train movements in the city</td>
</tr>
<tr>
<td>MRT - Circle Line</td>
<td>To cater for orbital movements around Kuala Lumpur. To provide linkages to key major developments identified in the DBKL City Plan such as Matrade. The line would also serve existing areas that are currently poorly served</td>
</tr>
<tr>
<td>MRT North-South Line</td>
<td>To cater for North South corridor which is forecasted to be overload in the future. To serve key developments such as Kampung Baru</td>
</tr>
<tr>
<td>LRT3 - Kelana Jaya - Klang</td>
<td>To provide improved linkages to Shah Alam and cater for local demands</td>
</tr>
<tr>
<td>Putrajaya Monorail</td>
<td>Improve linkages to centre of Putrajaya from Putrajaya Sentral</td>
</tr>
<tr>
<td>Kuala Lumpur Monorail</td>
<td>To cater for development areas in the south of Kuala Lumpur</td>
</tr>
<tr>
<td>Outer Orbital Line</td>
<td>To cater in the longer term for orbital movements, particularly in the LDP and N-S Expressway corridors. These are also corridors with land use developments in the longer terms associated with the Structure Plan</td>
</tr>
</tbody>
</table>

4.5 The Primary Corridor Rail Proposals

4.5.1 KTMB Passenger Services

As an initial consideration in the Greater Kuala Lumpur / Klang Valley Master Plan, the KTMB services should be enhanced and re-branded as ‘metro’ services to play a greater role in the public transport system of Greater Kuala Lumpur/Klang Valley. As a provider of a heavy rail network, the KTMB is currently underutilised with low passenger numbers at a number of station due to poor accessibility of the stations, lower service frequency and long journey times. Therefore the KTMB upgrade is aimed at addressing all of these issues and to allow the network to maximise the use of the network capacity.
On the Klang- Kuala Lumpur branch a targeted headway of 5 minutes in the peak period is proposed. This is subject to confirmation of signalling headways and verification of the level of other freight traffic on the route. Research for the Greater Kuala Lumpur/ Klang Valley Master Plan indicates that a significantly enhanced peak service could be offered along this line. With modern, high acceleration, rolling stock, it is estimated that the current end-to-end run time could be brought down to below an hour, thus offering an attractive service on the line.

The pattern of services should be examined. This should include the potential for mixing faster and slow services on the Klang line with some services operating as express services stopping only at key stations. Consideration should also be given to operating services between Klang and Kuala Lumpur but not running through to Batu Caves.

The selection of the KTMB upgrade from Klang is in preference to the construction of a new MRT line from Kuala Lumpur to Shah Alam and Klang. The impact of the latter was tested within the transport model and found to have less benefit than other proposals that have been included in the Greater Kuala Lumpur/ Klang Valley Master Plan. The KTMB upgrade provides similar benefits at a much lower cost.

Similarly on the Seremban to Kuala Lumpur branch a targeted headway of 5 minutes is proposed. This is subject to integration with any longer distance inter-city services that might operate to the south of Kuala Lumpur. The journey time from Seremban to Shah Alam and Klang. The impact of the latter was tested within the transport model and found to have less benefit than other proposals that have been included in the Greater Kuala Lumpur/ Klang Valley Master Plan. The KTMB upgrade provides similar benefits at a much lower cost.

In order to assist the development of the KTMB services, it is proposed that additional enhancements are made to the station facilities. An initial audit should be undertaken of all KTMB stations to assess current facilities, feeder services and local access by all modes. A comprehensive travel plan should be developed for each station to encourage greater use. Over time it is envisaged that the greater use of KTMB stations will encourage TODs to be developed along the corridor thus enhancing the local areas around stations. This will also increase the potential ridership in these corridors.

The service enhancement will need to be supported by a maintenance regime to maintain the quality of the asset and encourage ridership.

4.5.2 Freight Relief Line

To assist the enhancement of passenger service, there is a requirement in the URDP to develop a Freight Relief Line to divert freight trains to Port Klang away from Kuala Lumpur and the Klang Branch. Currently freight trains are taking a number of passenger train paths during the day. They operate at slow speeds and are reducing passenger train capacity. The Freight Relief Line will allow passenger services the maximum opportunity to improve headways. In addition, the Freight Relief Line would reduce the security hazards of freight trains passing through the city centre of Kuala Lumpur.
The alignment for the relief line should be considered in a more detailed study. The route could possibly linking Klang straight to the North bypassing Kuala Lumpur Sentral via Subang towards Sungai Buloh.

The provision of a freight relief line will also allow for the growth in rail freight services through increased demand through Port Klang. The route may also be available for passenger services and this should be investigated further.

4.5.3 MRT Circle Line

Orbital movements in Kuala Lumpur will be addressed by the provision of a Circle Line as MRT. This would link existing areas such as Mid Valley, Mont Kiara, Sentul Timur and Ampang, as well as proposed developments such as Matrade. The Circle Line would encourage modal transfers in corridors that are currently poorly served by public transport as well as providing relief to the radial lines for those direct orbital journeys which have to travel via the city centre.

It is proposed as an option that the Circle Line makes use of the Ampang Branch of the Ampang Line. This will allow a higher frequency service to be provided on the main Ampang line towards Sri Petaling. Figure 4.6 show the future networks in 2020 and 2030 respectively with the potential corridor recommended for further examination following the publication of the Greater Kuala Lumpur/Klang Valley Master Plan. The width of the corridor identified on the plan has a 2.5 km radius.

The Circle Line would be developed in at least two phases. The first would be the western and southern sections linking Ampang with Mid Valley, Matrade and Sentul. The second phase would line Ampang with Sentul Timur completing the north eastern sector of the Circle Line. Given the terrain to the west of the city, and the amount of existing development it is expected that a large proportion of the Circle Line is likely to be underground.

In the technical analysis to date it has been assumed that a station will be provided every 1.5 km. Subject to technical feasibility an initial estimate suggests a length of 29 km for phase 1 with 22 stations. The second phase would be 12 km with 8 stations. The operational study would need to examine the location for depot facilities.

4.5.4 MRT N-S Line

In the Northern corridor, even allowing for the upgrade to KTMB the future travel demands indicate that there will be a need to provide enhanced capacity. The land use maps in Chapter 3 indicated the additional intensification in the north western corridor from Kuala Lumpur. The KTMB service is forecast still to be overloaded so additional capacity is required. For this reason a new N-S line is proposed to link developing areas such as Sungai Buloh, Kepong and Selayang with the eastern half of the city centre (including Kampung Baru and Tun Razak Exchange (TRX). This will reduce overcrowding on the other city centre lines and allow KTMB to focus on longer distance commuter trains and inter-city services to the north of the country.

It is proposed that two Northern branches are provided (see Figure 4.6). The first would be to serve Selayang while the second would serve Sungai Buloh. The latter would potentially have the advantage of making use of possible depot facilities at this location as well as providing interchange with KTMB and MRT1. The N-S line is also proposed to provide a link to Pandan to improve connections to this area that was identified as a transit gap.

In total this would give a line of the order of 36 km served by 24 stations assuming a spacing of 1.5 km per station. Where the line operates in the city centre it is proposed that this should be underground. Where the line crosses existing rail lines it is proposed that interchange stations are provided. This will encourage interchange between lines.

In the longer term up to 2030, the line could be extended southwards towards Serdang and Putrajaya depending on the developments in that area.
4.5.5 LRT3 - LRT Line- Kelana Jaya- Klang

A spur of the LRT line should be built linking Klang to Shah Alam and the existing LRT at Kelana Jaya. The aim is to cater for local movements in these areas with services operating between Klang and Kelana Jaya. This will allow local demands to transfer from KTMB to LRT allowing KTMB to provide a longer distance suburban service. The exact alignment of the LRT is to be determined through engineering feasibility but the aim would be to complement the KTMB route along a parallel alignment rather than serve the same catchment areas. Therefore the LRT3 would provide a linkage to Shah Alam from both Klang and Kelana Jaya.

4.5.6 Kuala Lumpur Monorail

The Kuala Lumpur monorail is proposed to be extended from Tun Sambathan to Happy Garden to provide improved accessibility to Bangsar, Mid Valley and Happy Garden. This will provide congestion relief on the LRT lines approaching Kuala Lumpur Sentral from the South. The timing of this enhancement should be in accordance with local development pressures in the area. In continuation to that, the second phase of monorail extension which is from Happy Garden to Sunway would take place to complement the needs to serve the demand from south area of Greater Kuala Lumpur. The Kuala Lumpur Monorail Metropolis extension will serve the proposed Metropolis development on the existing Matrade linking the existing Inter Urban Transport Terminal to the development due to the anticipated traffic to be generated.

4.5.7 Putrajaya Monorail

The Putrajaya Monorail should be completed to provide improved local access within the city. This will provide a link to Putrajaya Sentral and encourage modal transfer to the ERL. The timing of this facility should be in response to development needs in Putrajaya.

4.5.8 LRT 4- Outer Orbital Line

In the longer term there is a need to provide some form of orbital relief along the LDP corridor. The sections through Petaling Jaya have particularly heavy private vehicle demands resulting in significant congestion. Initially consideration should be given to the bus network coverage in this area (see Bus Transformation Plan) but in the longer term additional capacity will be needed to link areas such as Gombak and Damansara to Petaling Jaya. An outer orbital LRT line should be considered for post 2020. The corridor for this LRT has not been defined at this stage and would be subject to later investigation.

4.5.9 Other Modes

The rail enhancements will be supported by enhancements to bus services in the region. These are set out in the Bus Transformation Plan of the Greater Kuala Lumpur/Klang Valley Master Plan. Improvements in the remaining secondary corridors would be using bus and BRT. The Bus Plan identifies how bus can support the rail system through feeder services as well as outlining the role of bus in non-rail corridors.

The implementation of these rail schemes will also complement the other elements of the Greater Kuala Lumpur/Klang Valley Master Plan in order to develop an integrated public transport system. This will include improvements to the bus network (see Bus Transformation Plan), transformation of the taxi system (see Taxi Transformation Plan), and the provision of enhanced interchange facilities (see Terminals and Interchange Plan) and the use of complementary travel demand management policies (Demand Management Plan). The plan will also allow for integration with land use policies being developed by DBKL and Selangor State, WP Putrajaya and the local authorities (see Land Use Plan). Each of these elements is outlined in the other Subsidiary Plans.
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(Note: for the newly proposed lines a 2.5km radius indicative corridor is identified within which an assessment should be undertaken of the appropriate alignment. The freight relief line shown here is assumed to use the Subang Spur line but further study might investigate an alternative route. The technical feasibility study should assess the requirement for MRT North-South Line to serve Sungai Buloh, particularly if there is a need for depot at this location. Commencement refers to the commencement of development process. Expected completion date refer to Table 5.1, however the plan is subjected to Government’s approval)

Interchange & Integration

Important to maximizing the benefit of the new lines and extensions will be to ensure there is good interchange and integration with existing and other new lines. Where rail lines intersect the detailed design phase should consider whether good interchange can be provided. There should be a presumption that interchange will be provided unless it duplicates other facilities or unlikely to provide benefits.

Rail interchange design should seek to ensure minimum interchange distances, that there is no need to leave the station, that ticketing is integrated and that information supports good interchange. Rail network design should be developed to provide well-planned rail to bus.

Key Conclusion

A rail strategy has been developed which seeks to maximise the use of the existing KTMB network while providing additional capacity in primary and secondary corridors as necessary.)
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5 PHASING AND DELIVERY
5 PHASING AND DELIVERY

5.1 Introduction
This chapter presents the proposed delivery timeline of the URDP.

5.2 Phasing
The proposed timeline for the implementation of the projects is shown in Figure 5.1 and Table 5.1. The exhibits also include the timeline for committed schemes including the LRT extensions and the MRT1 construction as well the establishment of bus feeder networks and BRT corridors. The rationale behind the timing and staging of the projects depends on achieving value for money, the expected levels of overcrowding on key corridors and how advanced the individual projects are.

In addition to enhancements, extensions and new lines, priority should be given to introducing monitoring, benchmarking and reporting systems that will enable identification of current operational and financial issues. Accordingly, the identified issues can be addressed to ensure that existing services operate to their maximum potential from an early date.

The KTMB upgrade project is proposed to be carried out until 2015. As part of the NKRA new rolling stock sets are due to be delivered in the next year which will allow a reduction in headway on the KTMB service. Investigations should be undertaken to confirm the potential of 5 minutes headways and service patterns (timetabling) on the Klang, Seremban and Rawang operations. This will include a review of signalling, track operations, station access and facilities, power supply and the use of the central stations. This will be supported by the development of the bus feeder networks and the re-branding of the services to a ‘metro’ style service.

A crucial element for the delivery of the five minutes passenger service headway will be the Freight Relief Line. The route should be confirmed as soon as possible to enable its construction to facilitate the re-routing of freight services away from the city centre of Kuala Lumpur. The timing of the construction would be confirmed during those investigations.

The MRT Circle Line is planned to be built in two phases. The first phase includes the section from Ampang to Sentul Timur via Mid Valley. Initial investigations would need to confirm the exact alignment, technical and engineering feasibility, station locations and depot locations. It is anticipated that much of the new construction sections would need to be in tunnel sections. The construction of this phase should tie in with the key developments in the corridor such as Matrade.

The proposal includes the use of the existing Ampang Line. Accordingly, there will be a period when that section is converted from LRT to MRT, and the line will not be operational. This will require alternative bus transport provision during the construction phase. The LRT line to Sri Petaling and Putra Heights can benefit from additional capacity once LRT services cease on the Ampang spur line.
The second phase of the MRT (North Eastern section) is proposed to be built at a later date. The completion of this corridor will be subject to viability in terms of travel demand and feasibility.

The MRT N-S line is planned to be built in two phases. The first phase is the sections from Selayang and Sungai Buloh to Pandan. Initial investigations would need to confirm the exact alignment, technical and engineering feasibility, station locations and depot locations. It is anticipated that the sections in the city centre would need to be in tunnel sections. The branches to Selayang and Sungai Buloh will be investigated in the technical study. A key consideration will be the location of the depot and this should be investigated at an early stage in order to identify the land requirements.

The second phase of the MRT (Southern section) is proposed to be built at a later date. The completion of this corridor will be subject to viability in terms of travel demand and feasibility.

The Kuala Lumpur monorail extension is to be considered by 2016 to enable it to tie in with development proposals along the corridor. The proposed corridor will be subject to viability in terms of travel demand and feasibility. Similarly the completion of the Putrajaya Monorail to provide greater connectivity between the city and the Putrajaya Sentral Station should be investigated for viability in relation to demands. The timing will be dependent on the local needs for the link to be constructed.

The Outer Orbital Line is a long term aspiration prior to 2030 and should be investigated when the local demands and modal share targets identify the need for the service.

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**Figure 5.1: Rail Scheme Summary**
### Table 5.1: Rail Scheme Summary

<table>
<thead>
<tr>
<th>Scheme</th>
<th>Year</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>LRT1 extension</td>
<td>2015</td>
<td>Extension to Putra Heights</td>
</tr>
<tr>
<td>LRT2 extension</td>
<td>2015</td>
<td>Extension to Putra Heights</td>
</tr>
<tr>
<td>MRT1</td>
<td>2017</td>
<td>Provide a new MRT line between Sg Buloh &amp; Kajang</td>
</tr>
<tr>
<td>Klang - Kuala Lumpur Sentral KTMB line</td>
<td>Pre 2020</td>
<td>Provide 5 minutes headway on the KTMB service between Klang &amp; Kuala Lumpur Sentral</td>
</tr>
<tr>
<td>Seremban - Kuala Lumpur Sentral KTMB Line</td>
<td>Pre 2020</td>
<td>Provide 5 minutes headway on the KTMB service between Seremban and Kuala Lumpur Sentral. Services continue to Rawang &amp; Batu Caves</td>
</tr>
<tr>
<td>Rawang - Kuala Lumpur Sentral KTMB line</td>
<td>Pre 2020</td>
<td>Provide a 7.5 minutes headway on the KTMB service between Rawang &amp; Kuala Lumpur Sentral</td>
</tr>
<tr>
<td>Batu Caves - Kuala Lumpur Sentral KTMB line</td>
<td>Pre 2020</td>
<td>Provide a 15 minutes headway on the KTMB service between Batu Caves &amp; Kuala Lumpur Sentral</td>
</tr>
<tr>
<td>Freight Relief Line</td>
<td>Pre 2020</td>
<td>To allow greater capacity to be provided for passenger train movements by removing freight trains from the city centre of Kuala Lumpur &amp; the Klang branch</td>
</tr>
<tr>
<td>KTMB Stations</td>
<td>Pre 2020</td>
<td>Initial station audit to be carried out of station facilities and interchange prior to upgrade. Enhance walking and cycling access to the stations</td>
</tr>
<tr>
<td>City Centre Stations</td>
<td>Pre 2020</td>
<td>Assess the need for facilities in the central area making more use of Kuala Lumpur station</td>
</tr>
<tr>
<td>KTMB Feeders</td>
<td>Pre 2020</td>
<td>Bus feeder services to key KTMB stations in order to develop the integrated system</td>
</tr>
<tr>
<td>MRT - Circle Line</td>
<td>Pre 2020</td>
<td>Provide new circle line from Sentul Timur to Ampang via Matrade, Mt Kiara, Bangsar &amp; Mid Valley. Section from Ampang to Miharja to replace current Star Line</td>
</tr>
<tr>
<td>MRT - North-south Line</td>
<td>Pre 2030</td>
<td>Complete Circle Line from Ampang to Sentul Timur</td>
</tr>
<tr>
<td></td>
<td>Pre 2020</td>
<td>Provide new N-S line from Sentul Pandan Jaya</td>
</tr>
<tr>
<td></td>
<td>Pre 2020</td>
<td>Provide extension to Selayang and or Sg Buloh</td>
</tr>
<tr>
<td>Putrajaya Monorail</td>
<td>Pre 2030</td>
<td>Provide extension from Pandan Jaya to Serdang / Putrajaya Complete Putrajaya Monorail</td>
</tr>
<tr>
<td></td>
<td>Pre 2020</td>
<td>Provide extension to Pandan Jaya to Serdang / Putrajaya Complete Putrajaya Monorail</td>
</tr>
<tr>
<td>Kuala Lumpur Monorail (Phase 1&amp;2)</td>
<td>Pre 2020</td>
<td>Complete Monorail extension from Tun Sambathan to Taman Gembira (Phase 1) &amp; extension till Sunway (Phase 2)</td>
</tr>
<tr>
<td>LRT Kelana Jaya - Klang</td>
<td>Pre 2030</td>
<td>Provide LRT spur from Kelana Jaya to Shah Alam and Klang</td>
</tr>
<tr>
<td>Kuala Lumpur Monorail Metropolis Extension</td>
<td>Pre 2030</td>
<td>Provide Monorail extension from Titiwangsa to KL Metropolis area (nearby Matrade)</td>
</tr>
<tr>
<td>Outer Orbital Line</td>
<td>Pre 2030</td>
<td>Provide orbital link from Gombak to Petaling Jaya via Damansara</td>
</tr>
</tbody>
</table>

*Note: Year refer to the expected completion year prior to Government’s approval.*
Each of the above elements will be supported by other elements of the Greater Kuala Lumpur/Klang Valley Master Plan which are reported in the other five Subsidiary Plans.

Together these provide an integrated land public transport plan for the Greater Kuala Lumpur/Klang Valley region and are summarised in the overall Greater Kuala Lumpur/Klang Valley Master Plan document. The Greater Kuala Lumpur/Klang Valley Master Plan also identifies the role of each of these measures in terms of proposed modal share targets which will be contained within the Greater Kuala Lumpur/Klang Valley Master Plan.

5.3 The First And Last Mile

The rail element is only one part of the passenger journey. Integration with other modes (public transport, private transport, walking and cycling) is important to maximise the potential usage of rail. This can be referred to as the ‘first and last mile’. The requirements for the ‘first and last mile’ will vary between the different accesses modes. The IIP will consider these requirements in more detail.

The integration requires:

- A network of feeder bus services to provide linkages to stations
- Good interchange facilities between modes to reduce the ‘barrier’ of changing modes
- Information systems to provide real time passenger information on the availability of bus and rail services
- Local information (maps) at stations to show local facilities, and access routes
- Easy access routes, covered footways and road-crossing facilities either at-grade or above/ below ground
- Stations and their accesses should to be secure and safe (i.e. lighting and close circuit security systems)
- Stations to provide cycle and motorcycle parking facilities

Key Conclusion

A phasing strategy has been derived which best serves the needs of the region.
• Introduction of multi-modal ticket systems to allow users to use one ticket/ smart-card which can be used on all modes
• Focus on transit oriented developments to allow housing and commercial developments
• Close to the stations which will encourage use of public transport

Key Conclusion
The first and last miles of a land public transport journey are crucial.
Measures must be introduced to maximise the benefits of rail by providing customers with integrated journeys that reduce the barrier of using land public transport.
TODs should be encouraged to maximise access to and use of land public transport.

5.4 Review Of Benefit
Greater Kuala Lumpur/Klang Valley Master Plan rail elements seek to increase peak capacity to meet future demand, reduce crowding on the radial primary corridors, improve accessibility and ‘join-up’ these routes with improved orbital services. The network is summarised in Table 5.2. The final Greater Kuala Lumpur/Klang Valley Master Plan includes a Multi-criteria assessment against the National Planning Guidelines objectives and indicators. A summary of this is provided in Table 5.3.

Table 5.2: Future Rail Network

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Route Length</th>
<th>No. of stations</th>
<th>Peak Hour Headway</th>
<th>Forecast Daily Ridership</th>
</tr>
</thead>
<tbody>
<tr>
<td>KTMB Metro (upgrade from Komuter)</td>
<td>157 km</td>
<td>50</td>
<td>5 mins</td>
<td>237,000</td>
</tr>
<tr>
<td>Kelana Jaya (Putra) (includes extension)</td>
<td>29km</td>
<td>24</td>
<td>2.5 mins</td>
<td>496,000</td>
</tr>
<tr>
<td>Ampang (Star) LRT2 (includes extension)</td>
<td>27 km</td>
<td>25</td>
<td>2.5 mins</td>
<td>352,000</td>
</tr>
<tr>
<td>Kuala Lumpur Monorail (includes extension)</td>
<td>16 km</td>
<td>20</td>
<td>5 mins</td>
<td>115,000 increasing to 172,000</td>
</tr>
<tr>
<td></td>
<td>Phase 1=7.5km</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Phase 2=8km</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Extension=17km</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kuala Lumpur Metropolis Extension</td>
<td>4.24 km</td>
<td>5</td>
<td>5 mins</td>
<td>62,500</td>
</tr>
<tr>
<td>KLIA</td>
<td>57 km</td>
<td>5</td>
<td>15 mins</td>
<td>16,500</td>
</tr>
<tr>
<td>MRT1</td>
<td>50.8 km</td>
<td>36</td>
<td>3 mins</td>
<td>445,000</td>
</tr>
<tr>
<td>MRT Circle Line</td>
<td>Phase 1=29km</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Phase 2=11.6km</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MRT North-South Line</td>
<td>Phase 1=38km</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Phase 2=23km</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LRT3</td>
<td>23.5km</td>
<td>16</td>
<td>5 mins</td>
<td>100,000</td>
</tr>
</tbody>
</table>
5.4.1 Ridership

The enhancement of KTM services provides greater radial capacity. The URDP is forecast to lead to 2.5X increased ridership on the KTMB services (through reduced waiting time, improved reliability, faster journeys). The URDP proposals are targeted to increase ridership by two fold on the LRT and Monorail services where they are expected to support more local demand with increase capacity and line extensions. Ridership levels on rail will increase fivefold to increase land public transport modal share, particularly to the centre of Kuala Lumpur. The additional capacity provides is equivalent to 48,000 cars (or 12 lanes of traffic flow) during the peak hour by 2020 due to MRT1, MRT Circle Line and MRT3 North-South Line service.

5.4.2 Over-crowding

The new N-S MRT line provides additional capacity in the eastern half of the city centre providing relief on other lines (see Figure 5.3). While the Ampang branch is identified as being overloaded for rail, additional capacity will be provided by the Circle Line. In addition, it is proposed that an enhanced bus corridor is provided along Jalan Ampang and this is identified within the Bus Transformation Plan.

Figure 5.3: 2020 Over-crowding Levels with the Greater Kuala Lumpur/Klang Valley Master Plan
5.4.3 Journey Times and Accessibility

The journey time maps to the centre of Kuala Lumpur in Figure 5.4 show a much greater area of lower land public transport travel times with the Greater Kuala Lumpur/Klang Valley Master Plan compared to existing commitments. Accessibility has also been mapped with the Greater Kuala Lumpur/Klang Valley Master Plan improvements and shown in Figure 5.5. This shows a greater area of improved accessibility including areas along the additional MRT lines and in the Klang Valley. This will assist the economic performance of the region.

Figure 5.4: 2020 Modelled Perceived Travel Time to KLCC with the Greater Kuala Lumpur/Klang Valley Master Plan
5.4.4 Benefits Summary

The Greater Kuala Lumpur/Klang Valley Master Plan will have a number of benefits (see Table 5.2). The increased land public transport provision will significantly enhance accessibility in the region which will assist the economic performance. By 2030 the network provision will increase to 34 km/ million people which is comparable to a number of other major cities such as Beijing (29 km/ million people), Moscow (28 km/ million people), Seoul (28 km/ million people), Tokyo (37 km/ million people) and Hong Kong (41 km/ million people).

Access to the network will be increased through the greater coverage and travel times will be reduced both in terms of waiting time and in-vehicle time. The improved land public transport supply will encourage modal transfer which will assist commercial operations on the highway network. A fuller appraisal of the Greater Kuala Lumpur/Klang Valley Master Plan is included in the main Greater Kuala Lumpur/Klang Valley Master Plan document.

5.5 Next Steps

Following publication of the URDP the next steps for the rail proposals are as follows:

- Completion of the remaining Subsidiary Plans and incorporation into the full Greater Kuala Lumpur/Klang Valley Master Plan (publication September 2011)
- Consultation on the Greater Kuala Lumpur/Klang Valley Master Plan proposals
- Technical and Financial Feasibility Study
- Technical and System Design
- Implementation
- Monitoring

The Greater Kuala Lumpur/Klang Valley Master Plan proposals generally indicate the corridors that would be served by the new lines. Once the approach and the proposed schemes have been confirmed, it will be important to develop the detailed alignment and station locations as a priority. This will both allow early completion and enable other developments along the routes of the new lines to complement and support their implementation and help enhance their success.
Key Conclusion

The rail strategy provides significant benefits in terms of improved accessibility, reduced travel time and integration with land use policy. The enhanced rail network will encourage modal share.

Overall the Greater Kuala Lumpur/Klang Valley Master Plan will assist the economic performance of the region.
### Chapter 1: Urban Rail Development Plan

**Objectives**

**Economic Competitiveness**
- **Access to Job**
  - The increased land public transport provision will significantly enhance accessibility for workers to reach jobs.
- **Access to International Links**
  - Improved links will be provided to Kuala Lumpur Sentral to facilitate international access to KLIA.
- **Reduce Journey Times**
  - Increased land public transport supply will reduce public transport journey times and will encourage modal transfer which will reduce congestion for private & commercial vehicles.
- **Increase Reliability**
  - Reduced congestion for private & commercial vehicles will aid reliability, land public transport reliability improved through improved supply & measures to improve system reliability.

**Access, Connectivity & Integration**
- **Improve accessibility**
  - Increased land public transport supply will close the transit gaps allowing more people access to the system.
- **Improved integration between modes**
  - Interchanges between rail & other modes will reduce the “barriers” of making a land public transport journey. This will be enhanced by integrated ticketing.
- **Improved integration between Transport & Land Use Planning**
  - The Greater Kuala Lumpur / Klang Valley Master Plan seeks to address the DBKL City Plan, Selangor State Plan & local authority plans. The enhanced rail network will aid TODs including along the KTMB corridor.

**Efficiency**
- **Journey Time Reliability**
  - Improvements to the rail system such as track and signalling will assist the provision of a reliable service.
- **Mode Share**
  - The provision of the rail improvements and new capacity will increase land public transport mode share.
- **Deliverability**
  - A deliverable plan will be established through detailed technical feasibility.

**Social Inclusion**
- **Providing access for all through better connectivity**
  - Increased land public transport supply will close the transit gaps allowing more people access to the system.

**Safety & Security**
- **Providing improved safety & security through quality public transport**
  - The design of the new lines will take into account the needs of all users.
- **Reduce road accidents through model transfer**
  - The encouragement of modal transfer will reduce the vehicle kilometres travelled in the region thus reducing accidents.

**Environment**
- **Improve air quality through modal transfer**
  - Modal transfer will reduce private vehicle kilometres and congestion thus improving air quality.

---

**Table 5.3: Summary of Benefits**

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<th>Objectives</th>
<th>Indicator</th>
<th>Impact</th>
</tr>
</thead>
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<td>Economic Competitiveness</td>
<td>Access to Job</td>
<td>The increased land public transport provision will significantly enhance accessibility for workers to reach jobs.</td>
</tr>
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<td></td>
<td>Access to International Links</td>
<td>Improved links will be provided to Kuala Lumpur Sentral to facilitate international access to KLIA.</td>
</tr>
<tr>
<td></td>
<td>Reduce Journey Times</td>
<td>Increased land public transport supply will reduce public transport journey times and will encourage modal transfer which will reduce congestion for private &amp; commercial vehicles.</td>
</tr>
<tr>
<td></td>
<td>Increase Reliability</td>
<td>Reduced congestion for private &amp; commercial vehicles will aid reliability, land public transport reliability improved through improved supply &amp; measures to improve system reliability.</td>
</tr>
<tr>
<td></td>
<td>Improve accessibility</td>
<td>Increased land public transport supply will close the transit gaps allowing more people access to the system.</td>
</tr>
<tr>
<td></td>
<td>Improved integration between modes</td>
<td>Interchanges between rail &amp; other modes will reduce the “barriers” of making a land public transport journey. This will be enhanced by integrated ticketing.</td>
</tr>
<tr>
<td></td>
<td>Improved integration between Transport &amp; Land Use Planning</td>
<td>The Greater Kuala Lumpur / Klang Valley Master Plan seeks to address the DBKL City Plan, Selangor State Plan &amp; local authority plans. The enhanced rail network will aid TODs including along the KTMB corridor.</td>
</tr>
<tr>
<td></td>
<td>Journey Time Reliability</td>
<td>Improvements to the rail system such as track and signalling will assist the provision of a reliable service.</td>
</tr>
<tr>
<td></td>
<td>Mode Share</td>
<td>The provision of the rail improvements and new capacity will increase land public transport mode share.</td>
</tr>
<tr>
<td></td>
<td>Deliverability</td>
<td>A deliverable plan will be established through detailed technical feasibility.</td>
</tr>
<tr>
<td></td>
<td>Providing access for all through better connectivity</td>
<td>Increased land public transport supply will close the transit gaps allowing more people access to the system.</td>
</tr>
<tr>
<td></td>
<td>Providing improved safety &amp; security through quality public transport</td>
<td>The design of the new lines will take into account the needs of all users.</td>
</tr>
<tr>
<td></td>
<td>Reduce road accidents through model transfer</td>
<td>The encouragement of modal transfer will reduce the vehicle kilometres travelled in the region thus reducing accidents.</td>
</tr>
<tr>
<td></td>
<td>Improve air quality through modal transfer</td>
<td>Modal transfer will reduce private vehicle kilometres and congestion thus improving air quality.</td>
</tr>
</tbody>
</table>
SUMMARY
SPAD has developed the NLPTMP to set out the vision and direction for land public transport in Malaysia. The purpose is to develop a long term programme to address the current deterioration in land public transport with plans to execute high impact and effective delivery initiatives for a 20-years sustainable national land public transport service.

The NLPTMP outlines the National Land Public Transport Policy which provides guidance and direction towards developing the National Master Plan. Included in the NLPTMP is also Planning Guidelines which provides the guidance on the methodology for setting objectives, plan development, identification of policy measures and assessments of solutions. The Planning Guidelines facilitates the development of Regional Master Plan and enables interfacing with State-specific plans and land use policies.

The first Regional Master Plan developed by SPAD is for the Greater Kuala Lumpur/Klang Valley region. The URDP is one of six Subsidiary Plans of the Greater Kuala Lumpur/Klang Valley Master Plan, and relates to urban rail development in the region. Together these six plans provide an integrated land public transport master plan for the Greater Kuala Lumpur/Klang Valley region.

In order to aid the development of the Greater Kuala Lumpur/Klang Valley Master Plan, a series of Guiding Principles have been developed examining issues related to accessibility, capacity, social inclusion and the environment.

Currently land public transport mode share in Greater Kuala Lumpur/Klang Valley is relatively low compared to other major cities and has fallen since the 1980s. This decline is in spite of increased population and households in the region. The fall in land public transport share reflects the increase of the highway network supply, changes in household characteristics such as reducing household sizes, the rise in household incomes, and the affordability of cars, the poor quality of public transport, and the unreliability of buses.

Analysis shows that journey times by private vehicle tend to be shorter than the equivalent journey by land public transport. Therefore accessibility to jobs by private transport is currently much greater than by land public transport.

It may be possible to improve existing services and performance significantly but in the absence of robust monitoring, benchmarking and reporting, this cannot be assessed with any certainty. An important element of the Greater Kuala Lumpur/Klang Valley Master Plan will be to introduce such systems and develop action plans to tackle any weaknesses identified.

Looking to the future, the land public transport network coverage has significant gaps in the rail network even allowing for the committed schemes. These are assessed in terms of land use, travel demand and travel pattern to inform the need for improvements in subsequent stages of the Greater Kuala Lumpur/Klang Valley Master Plan development.
Population will continue to grow in the region increasing the demand to travel. Employment intensification is proposed in key centres, particularly the centre of Kuala Lumpur. The employment areas will need good accessibility to maintain the economic status of the region.

The increase in population and employment will increase travel demands. This will put further pressure on the highway network with resulting congestion and unreliable journey times unless public transport capacity and performance improves so as to reduce traffic levels. Land public transport accessibility will be improved along the LRT extension corridors and the MRT extension but overall accessibility will worsen unless additional land public transport supply is provided.

The Greater Kuala Lumpur/Klang Valley Master Plan has set out definitions for developing the hierarchies of transport corridors based on primary, secondary, feeder and local/ district. The assessment process considers the role of each mode such that the growing travel demand can be met by the appropriate mode.

The range of primary and secondary corridors has been defined for the Greater Kuala Lumpur/Klang Valley region. The primary corridors focus on the access to the city centre of Kuala Lumpur while secondary corridors focus on orbital movements and the other centres. The volumes of demand in the primary corridors in Greater Kuala Lumpur/Klang Valley justify the provision of high capacity rail services.

A rail strategy (see Table 6.1) has been developed which seeks to maximise the use of the existing KTMB network while providing additional capacity in primary and secondary corridors as necessary through the inclusion of new lines and extensions of existing facilities. A phasing strategy has been derived which best serves the needs of the region by identifying those elements for completion by 2020 and 2030. The proposed rail schemes and indicative planning is shown in the table.

The first and last miles of a land public transport journey are crucial. Measures must be introduced to maximise the benefits of rail by providing customers with integrated journeys that reduce the barrier of using land public transport.

The rail strategy provides significant benefits in terms of improved accessibility, reduced travel times and integration with land use policy. The enhanced rail network will encourage increased land public transport modal share. Overall the Greater Kuala Lumpur/ Klang Valley Master Plan will assist the economic performance of the region.

The rail elements of the Greater Kuala Lumpur/Klang Valley Master Plan meet the guiding principles through the provision of additional capacity to improve accessibility; capacity and reliability (see Table 6.2). This will allow the region to develop economically.
Table 6.1: Rail Scheme Summary

<table>
<thead>
<tr>
<th>Scheme</th>
<th>Year</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>LRT1 extension</td>
<td>Pre 2015</td>
<td>Extension to Putra Heights</td>
</tr>
<tr>
<td>LRT2 extension</td>
<td>Pre 2015</td>
<td>Extension to Putra Heights</td>
</tr>
<tr>
<td>MRT1 SBK Line</td>
<td>Pre 2017</td>
<td>Provide a new MRT line between Sg Buloh &amp; Kajang</td>
</tr>
<tr>
<td>Klang - Kuala Lumpur Sentral KTMB Line</td>
<td>Pre 2020</td>
<td>Provide 5 minutes headway on the KTMB service between Klang &amp; Kuala Lumpur Sentral</td>
</tr>
<tr>
<td>Seremban - Kuala Lumpur Sentral KTMB Line</td>
<td>Pre 2020</td>
<td>Provide 5 minutes headway on the KTMB service between Seremban and Kuala Lumpur Sentral. Services continue to Rawang &amp; Batu Caves</td>
</tr>
<tr>
<td>Rawang - Kuala Lumpur Sentral KTMB Line</td>
<td>Pre 2020</td>
<td>Provide a 7.5 minutes headway on the KTMB service between Rawang &amp; Kuala Lumpur Sentral</td>
</tr>
<tr>
<td>Batu Caves - Kuala Lumpur Sentral KTMB Line</td>
<td>Pre 2020</td>
<td>Provide a 15 minutes headway on the KTMB service between Batu Caves &amp; Kuala Lumpur Sentral</td>
</tr>
<tr>
<td>Freight Relief Line</td>
<td>Pre 2020</td>
<td>To allow greater capacity to be provided for passenger train movements by removing freight trains from the city centre of Kuala Lumpur &amp; the Klang branch</td>
</tr>
<tr>
<td>KTMB Stations</td>
<td>Pre 2020</td>
<td>Initial station audit to be carried out of station facilities and interchange prior to upgrade Enhance walking and cycling access to the stations</td>
</tr>
<tr>
<td>City Centre Stations</td>
<td>Pre 2020</td>
<td>Assess the need for facilities in the central area making more use of Kuala Lumpur station</td>
</tr>
<tr>
<td>KTMB Feeders</td>
<td>Pre 2020</td>
<td>Bus feeder services to key KTMB stations in order to develop the integrated system</td>
</tr>
<tr>
<td>MRT - Circle line</td>
<td>Pre 2020</td>
<td>Provide new circle line from Sentul Timur to Ampang via Matrade, Mt Kiara, Bangsar &amp; Mid Valley. Section from Ampang to Miharja to replace current Star Line</td>
</tr>
<tr>
<td></td>
<td>Pre 2030</td>
<td>Complete Circle Line from Ampang to Sentul Timur</td>
</tr>
<tr>
<td>MRT - North-south Line</td>
<td>Pre 2020</td>
<td>Provide new N-S line from Sentul Pandan Jaya</td>
</tr>
<tr>
<td></td>
<td>Pre 2020</td>
<td>Provide extension to Selayang and or Sg Buloh</td>
</tr>
<tr>
<td></td>
<td>Pre 2030</td>
<td>Provide extension from Pandan Jaya to Serdang / Putrajaya</td>
</tr>
<tr>
<td>Putrajaya Monorail</td>
<td>Pre 2020</td>
<td>Complete Putrajaya Monorail</td>
</tr>
<tr>
<td>Kuala Lumpur Monorail (Phase 1&amp;2)</td>
<td>Pre 2020</td>
<td>Complete Monorail extension from Tun Sambathan to Taman Gembira (Phase 1) &amp; extension from Sunway (Phase 2)</td>
</tr>
<tr>
<td>LRT Kelana Jaya - Klang</td>
<td>Pre 2030</td>
<td>Provide LRT spur from Kelana Jaya to Shah Alam and Klang</td>
</tr>
<tr>
<td>Kuala Lumpur Monorail Metropolis Extension</td>
<td>Pre 2030</td>
<td>Provide Monorail extension from Titiwangsa to KL Metropolis area (nearby Matrade)</td>
</tr>
<tr>
<td>Outer Orbital Line</td>
<td>Pre 2030</td>
<td>Provide orbital link from Gombak to Petaling Jaya via Damansara</td>
</tr>
</tbody>
</table>

Note: Year refer to the expected completion year prior to Government’s approval
Table 6.2: Summary of the Greater Kuala Lumpur/Klang Valley Master Plan against the Guiding Principles

<table>
<thead>
<tr>
<th>Guiding Principle</th>
<th>Review of Greater Kuala Lumpur / Klang Valley Master Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consider the planning, integration &amp; co-ordination of all land public transport modes</td>
<td>The approach adopted has developed a corridor based approach to integrating the land public transport modes. These elements will be addressed further in the other Subsidiary Plans.</td>
</tr>
<tr>
<td>Define modal share targets</td>
<td>Mode share targets to be addressed in the main Greater Kuala Lumpur/Klang Valley Master Plan document. The provision of the rail improvements will form a key building block in achieving these goals.</td>
</tr>
<tr>
<td>Define complementary policies to allow the land public transport model share to achieve the targets</td>
<td>Integration with Land Use &amp; Demand Management Policies addressed through the subsidiary Plans to allow integration of the Greater Kuala Lumpur/Klang Valley Kuala Lumpur with Land Use. Stakeholder engagement process is developing those linkages such as between the URDP and city Plan and Structure Plan.</td>
</tr>
<tr>
<td>Allow land public transport to be socially inclusive to be the mode of choice for all users</td>
<td>Wider rail network coverage will increase the catchment areas for rail usage. Good design of the rail network will allow access for all users.</td>
</tr>
<tr>
<td>Provide for increased accessibility &amp; connectivity</td>
<td>The improved rail network will increase accessibility and connectivity to and between services.</td>
</tr>
<tr>
<td>Take account of the hierarchy of centres; primary centres in particular should be served by rail, where possible to encourage modal transfer</td>
<td>The design of corridors has taken account of the key centres within the Region.</td>
</tr>
<tr>
<td>Provide capacity to meet future demands efficiently and reliably to allow the region to grow economically</td>
<td>The rail network design matches capacity to demand and will increase accessibility &amp; reduce travel times thus providing benefits to the local economy.</td>
</tr>
<tr>
<td>Provide additional capacity to serve central Kuala Lumpur given its economic importance to the country</td>
<td>The rail network includes MRT lines to serve the city centre which will increase accessibility and reduce travel times thus providing benefits to the local economy. The expansion of the KTMB capacity will also complement the new lines.</td>
</tr>
<tr>
<td>Be based on a process of engagement with Stakeholders</td>
<td>This process is on-going through the Greater Kuala Lumpur / Klang Valley Master Plan development and will continue through implementation and review.</td>
</tr>
<tr>
<td>Take account of previous studies and plans where appropriate</td>
<td>The development of the Greater Kuala Lumpur/Klang Valley Master Plan has reviewed previous studies and taken account of the needs of the local authority development plans.</td>
</tr>
<tr>
<td>Seek to provide environmental benefits to the region in terms of noise and air quality</td>
<td>The rail network will encourage modal transfer which will reduce car traffic levels allowing improvements to the environment.</td>
</tr>
<tr>
<td>Corridors should be served according to the appropriate mode to meet demands</td>
<td>This is achieved through the Greater Kuala Lumpur/Klang Valley Master Plan development process.</td>
</tr>
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Chapter 1: Urban Rail Development Plan
BUS TRANSFORMATION PLAN
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### 7. Summary

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Background
1 Background

1.1 Introduction

The Bus Transformation Plan (BTP) is to set the basis for the development and integration of bus services in the Greater Kuala Lumpur/Klang Valley region. Its purpose is to define the standards that should be adopted in developing the bus network and to identify the regulatory framework to be adopted for procuring and licensing operators and bus services in the region that will deliver the vision and proposed service standards. At this stage of the process, it is not for the Master Plan to set the longer term detailed network as this will evolve as land use patterns change and as other infrastructure and services are introduced, particularly new and expanded rail services. Thus the Master Plan defines not only short and medium term proposals but also the process through which longer term developments will be achieved.

In developing the BTP it is recognised that an analysis of existing conditions was undertaken as part of the NKRA Urban Public Transport Lab (Pemandu, reported in December 2009). A series of short term initiatives were identified as part of the NKRA with implementation between 2010 and 2012. The NKRA initiatives related to bus included:

- Implementing dedicated bus right-of-ways: Bus Expressway Transit (BET), Bus Rapid Transit (BRT) and Bus Lanes
- Increasing coverage and quality of bus stops
- Enforcing traffic and operator service standards
- Improving and reorganising the bus network

In addition, other initiatives which also impact upon bus include:

- The programme of relocated and improved transport terminals to relief city centre congestion
- Establishing a single, better integrated ticketing platform across all operators
- Improving station integration facilities for intra-modal and inter-modal transfers
- Establishing and monitoring land public transport operator performance standards

The BTP seeks to build on these initiatives, adding new elements to allow the roll out of a transformed bus industry across the Greater Kuala Lumpur/Klang Valley region.
1.2 Structure Of The Bus Transformation Plan Document

This document provides a summary of the BTP for the Greater Kuala Lumpur/Klang Valley region. The next chapter (Chapter 2) outlines the current conditions in the region, particularly with respect to bus. Chapter 3 looks at the future of bus services. Chapter 4 looks at the process of developing the future of bus network proposals while chapter 5 outlines the method for transition of the regulatory regime. Chapter 6 provides the phasing of measures, the consideration of integration and the review of the benefits of the BTP. Chapter 7 provides an overall summary of the BTP.

Key Conclusions

SPAD has developed the National Land Public Transport Master Plan (NLPTMP) including a Planning Guidelines through which provides a rigorous approach to Master Plan development.

The National Land Public Transport Master Plan (NLPTMP) sets the building blocks for the Regional Master Plan.

The Greater Kuala Lumpur/Klang Valley Master Plan is the first produced by SPAD and follows a series of Guiding Principles. The BTP is one of a family of plans that supports the Master Plan.

The BTP establishes the role of the bus within the region. It defines the standards needed to transform the bus service and provide a planned and regulated regime to meet the requirements of the public.

The BTP seeks to build on the short term initiatives identified in the NKRA, adding new elements rolling these out across the Greater Kuala Lumpur/Klang Valley region.
2 ASSESSMENT OF CURRENT CONDITIONS
Chapter 2: Bus Transformation Plan

2 ASSESSMENT OF CURRENT CONDITIONS

2.1 Introduction

Chapter 2 provides an outline of the key considerations in the development of the Greater Kuala Lumpur/Klang Valley Master Plan. The starting point is the understanding of the existing conditions in the Greater Kuala Lumpur/Klang Valley region in relation to bus industry. This is based on engagement with stakeholders to collate data and identify key problems and issues.

2.2 Key Considerations In Master Plan Development

In developing the Regional Master Plans, a process of 9 stages are undertaken as outlined in Figure 2.1. Having identified the existing situation through analysis of data and stakeholder engagement, a review of the forecast travel situation in the region is identified. The key factors in the assessment are travel demands, including population (and employment), accessibility, travel pattern and travel time. Additionally, other considerations such as network, land use and known technical constraints are assessed (see Figure 2.1). Land use data is assembled from local authorities to reflect future population and employment changes identified in Structural Plans and Local Plans. The Regional Master Plan ensures alignment of state-level land public transport plans and the National Land Public Transport Policy, whilst placing importance on accommodating state-specific requirements. This is achieved through a consultative process and collaboration between State Authorities and SPAD in developing the Regional Master Plans. Additionally, the Regional Master Plans recognise the need for consistency between state plan directives and the necessity for land public transport. Therefore the Regional Master Plan takes account of the location of major development areas which need to be served by land public transport.

Figure 2.1: Master Plan Development Process

If land public transport is to be the mode of choice for a journey, it is essential that a reliable and appropriately planned transport network is available and information to plan the journey is available in advance.
The current provision of services fails to meet the needs and expectations of users. The present private operators’ pointed out that the present revenue levels do not allow them to reinvest within their businesses and contend that this is why the industry fails to meet the policies and objectives set out by the government. This issue was identified within the NKRA analysis in 2009 and a series of short term initiatives were developed to improve the quality of the bus service in the Greater Kuala Lumpur/Klang Valley region. These initiatives included:

- Implementing dedicated bus right-of-ways: BET, BRT, and Bus Lanes
- Increasing coverage and quality of bus stops
- Enforcing traffic and operator service standards
- Improving and reorganising the bus network

This BTP seeks to build on the momentum set by these initiatives and broaden their scope to cover the region.

BTP in its wider context also addresses the provision of BET and BRT services. Both of these services seek to operate on corridors where there’s high demand and the opportunity to transport a higher volume of passengers compared to the more conventional services at the same headway. Currently there are no BRT services operating within the Greater Kuala Lumpur/ Klang Valley region, a separate study in parallel to the Master Plan is addressing the development of BRT. Findings of that study will be taken into consideration of this BTP.

However there are several BET services already in operation. These operate tidally on some key radial corridors during the peak periods and provide much faster and direct links to or from centre Kuala Lumpur and have proven to be popular and well used.

The following sections outline the existing condition of the bus industry as well as identifying some of the key issues and challenges. An overriding concern is that with the current licensing system and operation method, it is difficult to assemble information and data about the bus industry. There is an overall lack of detailed understanding on current bus services delivery. An early task to address this concern is to introduce a rigorous licensing requirement so that operators will need to notify the details of the services they provide an update on any changes that they make to the services. This exercise will enable future network planning to be carried out with confidence, and, importantly, provide information database for passengers and potential passengers.

2.3 Existing Bus Services

The current method of bus operation services in the Greater Kuala Lumpur/Klang Valley region results in severe service quality, reliability and delivery issues. The existing delivery of services, perceived lack of integrated or comprehensive bus planning, unpublished timetables, uncoordinated services and distinct lack of enforcement of operating rules indicates that the services are failing to meet the needs of Greater Kuala Lumpur/ Klang Valley. There is also a general lack of effective regulation and enforcement. These issues require to be addressed through a new regime controlled through an improved regulatory framework that matches improved service delivery with bus network planning which takes into consideration land use changes and the relationship between bus services and the other land public transport modes in the hierarchy. This will ensure better integration in order to meet the needs of present users and ensure that services become attractive to a wider range of potential users.

There is an extensive bus network operated by Rapid KL, Metrobus and a number of smaller operators. Figure 2.2 shows the road network covered by bus services in the region. The information shown below relates primarily to local stage carriage services operating across the Greater Kuala Lumpur/Klang Valley region in early 2011. The current bus system is provided by 13 main operators plus a handful of smaller operators who operate on the periphery of the urban areas. Table 2.1 summarises current service provision.

The salient features of the present bus service provision are as follows:
The existing service pattern focuses on central Kuala Lumpur and is principally concentrated on the main corridors of movement where a high frequency level of service can be found. These tend to be radial routes emanating from Kuala Lumpur where operators are likely to experience high ridership and high levels of revenues. However the physical structure of the highway network combined with the way services are actually operated means that service accessibility, availability and integration is limited. The lack of coordination or regulation means that oversupply often occurs and competition between operators is often duplicative rather than adding any new services to the network.

At the outer end of journeys there is little penetration to residential areas and analysis indicates that large numbers of people are not within a reasonable walking distance to a bus service. The provision for good land public transport penetration of emerging areas is generally not being considered at the allocation of land use planning stages thus resulting in the land public transport service patterns not mirroring emerging land use patterns. This situation is exacerbated in the lower density fringe areas of the conurbation. These areas are more difficult to serve effectively with bus services and thus dependency on private motor vehicles is likely to be higher.

The large industrial areas within the region are poorly served by bus services and are likely to be difficult to serve comprehensively owing to their layout - some employers continue to use contracted buses to move labour.

There are little evidences that in zoning the location of new development, the need for good land public transport access, bus access and penetration are taken into account in the development planning. This approach to bus access and related facilities undermines future provision.

There appears to be nothing in the legislation to prevent the advanced planning of a bus network for the region. However there are implementation and regulatory issues associated with the interpretation and application of regulations, service licensing, and financial support that prevent this from taking place or prevent it from being implemented effectively. Bus service implementation is not carried out according to a strategy and this result in an uneven distribution of bus resources and some competitive duplication of services by two or more operators.

Table 2.1: Existing Bus Services

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Routes</td>
<td>- RapidKL - 162</td>
</tr>
<tr>
<td></td>
<td>- Metrobus - 40</td>
</tr>
<tr>
<td></td>
<td>- Selangor Omnibus - 11</td>
</tr>
<tr>
<td></td>
<td>- SJ Bus - /</td>
</tr>
<tr>
<td></td>
<td>- Len Seng - 5</td>
</tr>
<tr>
<td></td>
<td>- City Liner - 3</td>
</tr>
<tr>
<td></td>
<td>- Permata Kiara - 3</td>
</tr>
<tr>
<td></td>
<td>- Sri Indah - 2</td>
</tr>
<tr>
<td></td>
<td>- Trinton Commuter - 2</td>
</tr>
<tr>
<td></td>
<td>- Roadliner - 1</td>
</tr>
<tr>
<td></td>
<td>- Wawasan Sutera - 1</td>
</tr>
<tr>
<td></td>
<td>- Sks KL - 1</td>
</tr>
<tr>
<td></td>
<td>- Causeway Link - 1</td>
</tr>
<tr>
<td>Fares</td>
<td>- Zonal System (differs between operators subject to statutory maximum)</td>
</tr>
<tr>
<td></td>
<td>- RapidKL Concession Tickets and monthly passes</td>
</tr>
<tr>
<td>Average Speed</td>
<td>AM peak between 9 and 15km/hr</td>
</tr>
<tr>
<td>Daily Ridership</td>
<td>380,000 (RapidKL only)</td>
</tr>
<tr>
<td>Bus Stops</td>
<td>4,280 (relatively low for number of route kilometres) Few bus stops display any passenger information</td>
</tr>
</tbody>
</table>
2.4 The Role Of Private And Public Bus Operators

From available data it is estimated that there are a total of 13 operators within the Greater Kuala Lumpur/Klang Valley region providing bus services. A number of bus services in the region, are provided by or through private/commercial operators, who provide services for their own commercial and financial gain.

The largest operator in the region is Rapid KL, a public operator who, on behalf of its holding company Prasarana, operates bus services in the region. Prasarana was established in 1998 to assist in reforming the bus industry in the Greater Kuala Lumpur/Klang Valley region, and took over bus services provision in 2004, thus establishing the Rapid KL bus services division.

Prasarana is a 100% government owned company that was set up to own the assets of land public transport services in Kuala Lumpur.

One of the key concerns for operators who operate commercially is that they are currently unable to directly compete on a fair basis with Rapid KL. They believe that Rapid KL enjoys an unfair advantage through the investment that is received by that company through its holding company. They also believe that their inability to compete has negative impacts both on their own operations and on the industry as a whole.

2.5 Bus Service Planning

Bus service planning is carried out by each operator acting unilaterally. There is at present no overall bus route strategy. Service delivery is required by law to be within the terms and conditions set down in the route licences granted to the operators. However operational observations demonstrate that the levels of service provided differ in many respects from those authorised in the route licences.

The route licence application form (LPKP3, 2005) requires the submission of route details including a timetable; however this appears to be provided only very infrequently if at all and any data supplied initially is not updated when services are altered. Additionally there is a requirement for the local councils to be consulted and provided the opportunity to comment on the need for the proposed service to the licensing board prior to issuance. There is little evidence of prior consultation, although this does take place where for example new bus stop infrastructure is required.

In summary, although the mechanisms are in place for detailed service proposals to be put forward for at least some strategic consideration of the need for a particular route, there is at present no overall strategic policy that proposals can be set against, no strategic network planning either for the local bus industry alone or for its integration with other land public transport modes, or its contribution to wider transportation policy.

Very little data has been made available by operators to establish an accurate account of the level of bus network planning being done. At an operational level individual operators ensure that service operation is delivered as efficiently as possible within their own pool of services. However even at this level the day to day operation of individual services appears to be conditioned by the manner in which competing operators are performing on the same corridor or route.

In the case of some operators, a system of “license sub-letting” or “mini-franchising” means that the person or organisation to whom a license is issued may not be aware of the detailed delivery of services.

In the case of Rapid KL, their broad objectives and the manner in which they are funded should acknowledge wider transportation policies and the need for integration. However the general lack of compliance with the requirements of the regulatory process as it stands at present can be considered to be restricting their ability to integrate services effectively or provide comprehensive services.

The visual effects of this lack of planning and coordination is shown in the day to day operations of heavily concentrated vehicle allocation to key radial routes; with the requirement placed on generating revenue as opposed to delivering on policy objectives. Competition between operators takes place on the road and tends to be “duplicative” in that operators...
focus their resources on key corridors and the times of day when demand is highest. Provision at shoulder periods is much reduced and there is evidence of considerable day to day variation in the volume of bus resources available to passengers, especially during these off-peak periods.

In summary, this comparatively ad-hoc approach to service delivery results in direct on-street competition, fare competition, the ineffective use of resources (both vehicles and staff) and potentially the demise of those operators who operate marginal services. It is impossible to provide accurate and timely information for passengers in such scenario as little or no attempt is made by operators to manage their operations in a manner that is likely to offer consistency. Thus local bus services become a “last resort mode” and those who have the choice of alternative modes exercise that choice. Whilst being critical of the present way the bus industry operates, this commentary does not ignore the impact of congestion and general traffic conditions to the reliability and regularity of bus services. A wide integrated approach to transportation policy should embrace physical and electronic measures to assist the operation of bus services as well as a broad Travel Demand Management (TDM) policies is required to affect mode switch towards land public transport.

Based on information collated from bus operators, Figure 2.3 shows the density of routes in terms of buses per hour during peak period and demonstrates clearly the focus of the network on routes to the centre of Kuala Lumpur. Under the current regulatory regime these are likely to be the most profitable routes, but the same corridor is being operated by a number of different operators.

**2.6 Bus Service Coverage And Integration**

Two key measures used in a wide range of applications to measure bus route coverage are connectivity and accessibility. Connectivity and accessibility is widely used interchangeably, for the purposes of this study:

- Connectivity refers to the availability of a land public transport link between an origin and destination, for example a suburban area and centre Kuala Lumpur; whereas
- Accessibility is a more precise local measure of the accessibility of, say, a bus service, often expressed as the travel distance to a stop or interchange and governed by standards set as walking distances.

There is general agreement that connectivity can be improved and that in terms of accessibility currently only 61% of the travelling public are within reasonable (400 metres) distance of a bus service. This poor accessibility and consequent lack of connectivity inevitably undermines use of bus services. With the introduction of MRT services in the future, a continuing lack of local connectivity to MRT stations will seriously reduce the potential of the MRT system to perform its intended role.
Integration between different land public transport modes and between bus services can be described as sporadic across the region. In the central areas, where existing rail services are provided, bus to rail integration and the connectivity it provides is achieved with relative success but this is much less evident elsewhere. Whilst significant improvements in seamless interchange have been achieved through recent ticketing initiatives, the promotion of integration between modes remains generally poor. This will remain so whilst bus operators fail to publish timetables and route information in sufficient detail for passengers to plan their travel in confidence.

Thus a general conclusion can be reached that there are significant gaps in the levels of bus services currently provided. These need to be addressed through the development of localised bus service networks that would also act as a feeder bus service network to meet the growing demands of the region and the emerging enhanced rail network including the MRT system.

The following three diagrams present an analysis of gaps in the provision of land public transport and where feeder bus networks can be developed to support the rail based level of the integrated land public transport hierarchy.

Figure 2.4 shows the analysis undertaken as part of the NKRA to reveal ‘White Spaces’ areas beyond a reasonable walking distance of a bus service. The NKRA review assessed the census tracts in the region and identified the level of accessibility to bus services (defined as population living within 400 metres of a bus service). The NKRA analysis identified that 61% of the population had good access to bus services, but this left 39% of the population living over 400 metres from a bus service. Figure 2.5 indicates ‘white spaces’ showing service levels, and gaps, in their existing provision. The darker blue areas indicate those census tracts with higher levels of service while the lighter areas indicate those areas with less accessibility to bus services.
Figure 2.6 demonstrates gaps in the network in relation to existing rail services; and where, through an improved network, bus services would need to operate in order to provide comprehensive land public transport coverage and improved integration.

Considered together, these diagrams indicate the areas of highest population and need. The NKRA proposed an additional 53 services to increase the population within 400 metres of a bus service to 70%. The aim for the Master Plan would be to increase this percentage to a higher level.
2.7 Fares

There exists currently a zone fare structure within the Greater Kuala Lumpur/Klang Valley region. The lowest fare charged is RM0.70 within a single zone, to RM3.00 which is charged to travel from Zone 1 to Zone 4. The table below provides the zone structure and fares charged.

Table 2.2: Existing Fare Structure (June 2011)

<table>
<thead>
<tr>
<th>Zone</th>
<th>Fare</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Zone</td>
<td>RM1.00/RM0.70</td>
</tr>
<tr>
<td>2 Zone</td>
<td>RM1.90 / RM1.20</td>
</tr>
<tr>
<td>3 Zone</td>
<td>RM2.50 / RM1.60</td>
</tr>
<tr>
<td>4 Zone</td>
<td>RM3.00 / RM2.00</td>
</tr>
</tbody>
</table>

The first set of fares in the table is those charged by all operators other than Selangor and Rapid KL and the second set are charged by Selangor.

The fare paid is determined by the number of zone boundaries crossed. All single zone charges are applied when a passenger travels within a given single zone such as within the city centre and this applies regardless of which zone the journey is in. Two zone charges occur when a passenger travels from one zone to the next, such as for example from Zone 1-2, 2-3, or 3-4 and vice versa. Three zone charges apply when traveling across two zone boundaries, such as from zone 1-3 or 2-4, while four zone charges (seldom used) are for travel from the first zone to the fourth zone, which would be from the city centre to the remote areas.

For Rapid KL buses however, their ticketing system follows the zone system for single-journey UTAMA (trunk) services only. While the BANDAR (city) and TEMPATAN (local) routes operate on a fixed-fare structure. The BET services follow the fare structure of the UTAMA services.

Concession fares are restricted to students in uniform, people above 60 years of age and the disabled. These are made available through a form-based application process. Rapid KL also issues multiple journey passes for various types of individual or combined services for bus and rail which are available 1, 3, 7, 15 or 30 day passes.

Individual consultations with the larger operators revealed a range of fares related concerns:

- Fares not being set at a sufficient level to generate investment back into the organisation to enable key requirements such as fleet investment, improved staff training or to maintain operator viability
- Regular fare evasion occurring and the lack of proper penalties being enforced, which results in the inability for the operators to recoup costs and reinvest in services
- Increased ‘over-riding’ through zones and the lack of enforcement to counter this

The Touch’n Go system which is a prepaid ‘smartcard’ for transport payments such as tolls and parking has been extended to local land public transport. The cards offer users the ability to prepay for travel prior to boarding the bus. Currently this system is only available for Rapid KL services. Part of the on-going NKRA initiative is to ‘establish a single cashless mode of payment across all land public transport operators building upon the Touch’n Go platform with the potential to introduce an integrated travel fare across

<table>
<thead>
<tr>
<th>Bus Service</th>
<th>Adult Fare</th>
<th>Concession Fare</th>
</tr>
</thead>
<tbody>
<tr>
<td>UTAMA (Trunk)</td>
<td>RM1.00 (1 zone)</td>
<td>RM0.50 (1 zone)</td>
</tr>
<tr>
<td></td>
<td>RM1.90 (2 zones)</td>
<td>RM0.90 (2 zones)</td>
</tr>
<tr>
<td></td>
<td>RM2.50 (3 zones)</td>
<td>RM1.20 (3 zones)</td>
</tr>
<tr>
<td></td>
<td>RM3.00 (4 zones &amp; more)</td>
<td>RM1.50 (4 zones and more)</td>
</tr>
<tr>
<td>BANDAR (City)</td>
<td>RM1.00</td>
<td>RM0.50</td>
</tr>
<tr>
<td>TEMPATAN (Local)</td>
<td>RM1.00</td>
<td>RM0.50</td>
</tr>
<tr>
<td>EKSPRES</td>
<td>RM3.80</td>
<td>RM1.90</td>
</tr>
</tbody>
</table>
all operators and modes thereafter’. The aim therefore is to increase use of the system to include KTM and other bus operators. At present the card is in effect a single operator card. More universal availability will require the participation of all operators. This raises complex issues of revenue apportionment with four main dimensions:

- Apportionment of revenue collected by operators, unless it remains “where it falls” - an arrangement likely to favour the larger operators
- Apportionment of revenue from tickets sold by ticket agents such as retail outlets
- Allocation of costs and commission to agents
- How to share the costs of any discounts offered to passengers for multiple pre-purchase of trips

The availability of inter-operator tickets however is consistent with a multi-mode and multi-operator situation. There are many examples of such tickets in conurbations with route group or area based franchising whereby a company has been incorporated to handle the redistribution of revenue. In UK there are long established arrangements in the areas outside London where bus services operate on a deregulated basis and many cities in mainland Europe where bus services are provided through franchises or concessions.

Whilst the introduction of pre-purchased stored value cards has afforded the operators real benefits such dwell times at bus stops, reduced driver cash handling and consequent fraud, there is still a general concern that owing to the lowest top-up value being set at RM1.00, the card does not serve the purpose of encouraging pre-purchase for which it was designed. There appears to be scope for increasing the lowest fare value by which the card can be topped up and possibly offering a discount for travel when the card is topped up with a value in excess of a specified amount, for example RM20.

It is important to highlight that ‘cash fare’ collection is still widespread, and that take-up for the prepaid card on buses is deemed to be low. International experience suggests that higher level of discount on prepaid tickets (or a premium on cash payment), or some other device such as no change given on the bus, is needed to promote higher levels of prepaid cards take-up. It would also be appropriate to consider the ticket types or ticket formats targeted to particular market segments. A very successful campaign aimed at young people some years ago in Hong Kong involved a popular brand of digital wristwatch capable of holding stored value and that admission to the bus, tram or MRT required the watch to be swiped on a reader.

### 2.8 Journey Times

NKRA have set up a series of monitoring surveys to assess travel conditions and satisfaction levels of land public transport users. Travel time surveys were undertaken on a number of routes to compare bus and private vehicle travel time during morning peak. These were supplemented by a series of surveys for the Master Plan. Table 2.4 shows the bus travel time required for corridors in Kuala Lumpur. Typically these are slower compared with private vehicles. These travel times reflect door to door journey times and therefore includes walking and waiting time elements as well as in-vehicle travel times.

The greater the level of congestions the more similar are the journey times for the in-vehicle sections of a trip. The provision of bus priority measures, whether for use by all buses or BRT buses only, can reduce land public transport journey times to a level that can compete with or even better private vehicles. The provision of tracked transit such as LRT or MRT supplemented by feeder bus services offers the potential of significantly faster and more reliable journey times.

#### Table 2.4: AM Peak Travel Time Inbound To/ Outbound From Centre Kuala Lumpur (average in minutes)

<table>
<thead>
<tr>
<th>Location Surveyed</th>
<th>Inbound</th>
<th>Outbound</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kota Damansara</td>
<td>119</td>
<td>76</td>
</tr>
<tr>
<td>Serdang</td>
<td>113</td>
<td>60</td>
</tr>
<tr>
<td>Balakong</td>
<td>89</td>
<td>86</td>
</tr>
<tr>
<td>Subang Airport</td>
<td>84</td>
<td>43</td>
</tr>
<tr>
<td>Kajang</td>
<td>79</td>
<td>47</td>
</tr>
<tr>
<td>Puchong</td>
<td>65</td>
<td>61</td>
</tr>
<tr>
<td>Putrajaya</td>
<td>64</td>
<td>55</td>
</tr>
<tr>
<td>Klang</td>
<td>60</td>
<td>36</td>
</tr>
<tr>
<td>Subang Jaya</td>
<td>60</td>
<td>46</td>
</tr>
<tr>
<td>Old Klang Road</td>
<td>56</td>
<td>35</td>
</tr>
</tbody>
</table>


2.9 Travel Demands

Feedback from stakeholders indicates that the mode share of car has been increasing in recent decades. The morning peak modal share for land public transport has fallen from 34% in the 1980’s to 10-12% in 2008 (Source: NKRA). The land public transport share is relatively low compared to other international cities such as Hong Kong (90%), Singapore (63%), and London (55%). This reduction in the land public transport share reflects the:

- Increase of the highway network supply
- Changes in household characteristics such as reducing household sizes
- Rise in household incomes
- Affordability of cars and fuel
- Poor quality of land public transport.
- Poor image and unreliability of buses.

There is clear evidence that on key corridors services are operating at substantially below full capacity even at peak hours. As a result largely of congestion levels and bus journey time variability, it is unlikely that the “offer” available to passengers for peak hour bus journeys is sufficiently attractive to affect a mode switch from private vehicles. In order to maintain reasonable peak period capacity under present conditions it would be necessary for bus operators to put additional buses into service during peak hours. These buses would be extremely costly to provide but as a yardstick, a bus that is used for say four peak hours per day as opposed to say 18 hours per day of full service can attract costs that are between 60% and 70% of the 18 hours per day cost.

Under the present, in effect, open market conditions for operating buses and given the difficult operating conditions, it is not surprising that the overall bus network is far from comprehensive, with large areas of Greater Kuala Lumpur/Klang Valley and significant areas of the conurbation with little or no service. Additionally the frequency on many routes is low and the daily operating spread (the number of hours between first and last bus) is limited. There is evidence that especially at periods of lower demand, the availability of buses is variable day to day. All of these factors are likely to reduce demand for bus services and, inevitably, encourage more people to use private vehicles adding to congestion and reducing overall mobility.

2.10 Interchanges And Bus Stations

NKRA (2009) identified the issue of terminal locations and interchange facilities for bus services whether inter-city, inter-urban and city feeder services, resulted in an uncoordinated and inefficient network with the routes of many services overlapping, overcrowding on services and bus congestion in the Central Business District (CBD) area, for example in the area of the Central Market. Further information is available in the Interchange and Integration Plan. Key issues included:

- Poor quality facilities in the main terminals for inter-urban and intra-urban services
- Poorly designed traffic circulation for city central feeder routes which creates congestion for all traffic and substantially add to bus operating costs
- Buses park haphazardly due to the lack of parking bays and due to the poor levels of control by operations supervisors

Table 2.5: Interchange Facilities in Greater Kuala Lumpur / Klang Valley

<table>
<thead>
<tr>
<th>Type</th>
<th>Terminal</th>
<th>Purpose</th>
<th>NKRA Proposal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integrated Transport Terminals</td>
<td>Bandar Tasik Selatan, Gombak, Kota Damansara</td>
<td>Primarily leisure travel from all cities</td>
<td>Gombak, Kota Damansara</td>
</tr>
<tr>
<td>Inter-urban</td>
<td>Hentian Putra, Pasarama Kota, Pudu</td>
<td>Daily travel within 60km radius of CBD</td>
<td>Refurbish 3 existing terminals, reroute express buses to ITTs</td>
</tr>
<tr>
<td>Intra-urban</td>
<td>14 Hentian Akhir Bandar (&quot;HAB&quot;)</td>
<td>Daily travel within 30km radius of CBD</td>
<td>Upgrade 14HABs, rerouting of bus routes based on zones (medium term initiative) may take more time</td>
</tr>
<tr>
<td>City Feeder</td>
<td>City feeder buses</td>
<td>Daily travel within boundaries of CBD</td>
<td>Establish commercially sustainable model for operators</td>
</tr>
</tbody>
</table>

(Source: Pemandu NKRA 2009) Type Terminal
NKRA defined four types of interchange with proposals to enhance these (as shown in Table 2.5):

- Integrated Transport Terminals (ITTs) – defined as intercity terminal points in Kuala Lumpur
- Inter-urban – defined as terminal points in Kuala Lumpur for services up to 60km
- Intra-urban – defined as terminal points in Kuala Lumpur for services up to 30km
- City feeder – defined as terminal points for services operating largely or solely within the CBD

Looking at the region as a whole, there are 50 bus ‘terminals’ which serve the region (see the Interchange and Integration Plan). The terminals are defined principally as:

- 1 Integrated Transport Terminal
- 22 Bus Stations
- 27 Bus and Rail Interchanges

2.11 Roadside Infrastructure

NKRA report published in 2009 identified that there are currently in the region 4,150 bus stops across the Greater Kuala Lumpur/Klang Valley region. Key issues identified was that the majority of bus stops in the CBD area are badly designed, not well built or maintained, not bus friendly (i.e.: lack of bays), poorly lit at night, posing a threat to the safety of users and not user-friendly facilities. Many are poorly located in relation to the principal facilities they serve and in particular do not relate well to highway crossing points. The route network especially within centre Kuala Lumpur means that boarding and alighting stops for any given location can be a long distance apart, and thus this places great emphasis on good information for users, which is unfortunately lacking at present.

What should be provided at each stop is currently dependent upon its location and the number of services that use the stop. Where roadside infrastructure is provided, it varies between a bus stop pole, timetable case and bus stop flag (or a combination of one or both of the latter two).

![Figure 2.7: Location of Terminal Locations in Greater Kuala Lumpur Klang Valley](image-url)
In addition, in city centre locations there are a number of high quality bus stops that also have open-ended cantilever bus shelters, which provide waiting customers with shade and shelter. These shelters often carry heavy advertising, and are located in tourist or high catchment locations. Many stops further away from the city centre have much poorer shelters and which requires upgrading.

It is not uncommon to see shelters in outlying areas, but these are typically not modern, are of varying quality, and are often poorly maintained or not maintained at all.

NKRA classified bus stops in four categories. These are defined in Table 2.6 along with the numbers of stops per category in use at the time of compiling the report. NKRA included proposals to increase the number of bus stops by around 850 and provide upgrades to around 640 current bus stops.

Table 2.6: Bus Stop Classifications

<table>
<thead>
<tr>
<th>Type</th>
<th>Number</th>
<th>Place</th>
<th>NKRA Proposals</th>
</tr>
</thead>
<tbody>
<tr>
<td>High quality</td>
<td>359</td>
<td>• City Centre  • High Density Catchment • Tourist Spots</td>
<td>• Stops have adequate shelter, lighting &amp; advertising  • Potential upgrades required to include service information</td>
</tr>
<tr>
<td>Adequate shelter</td>
<td>2,090</td>
<td>• Residential areas • Schools</td>
<td>• Stops have adequate shelter  • some may require upgrades to improve facilities  • Upgrades required to include service information</td>
</tr>
<tr>
<td>Flagpole</td>
<td>1,059</td>
<td>• Lower density catchment areas</td>
<td>• Some can be upgraded to have adequate shelter  • Upgrades required to include service information</td>
</tr>
<tr>
<td>Stop with no infrastructure</td>
<td>641</td>
<td>• Very low density catchment areas • 'Informal' bus stops</td>
<td>• Quick win - install basic infrastructure across all stops  • Upgrades required to include service information and basic &quot;flagpoles&quot;</td>
</tr>
</tbody>
</table>

(Source: Pemandu NKRA 2009)

2.12 Bus Priority

Currently (as of mid-2011) there is very little in terms of bus priority measures across the bus network. The term ‘bus priority’ includes physical or traffic restriction measures that help reduce delays, and increase bus operating speeds, for example bus lanes. Equally important are Intelligent Transport Systems (ITS) based measures such as selective vehicle detection which assist in expediting bus services through a queue of traffic to ensure that operations are efficient and reliable.

Bus priority measures play an integral part in ensuring that bus networks are reliable, not hampered by congestion, and offer competitive and consistent journey times. Whilst important in making the bus network attractive to existing and especially potential passenger’s bus priority measures are equally important to operators in helping them control costs and maintain capacity especially at peak times.

Bus priority measures are of particular value when service providers operate on heavily used traffic corridors, or where there is a need for high capacity such as on a very frequent local bus service, or key radial corridors, or a BET or BRT service. However, wherever buses are delayed and priority can be given to buses without undue disruption to other road users or adjoining land uses, these should be considered to help increase the attractiveness and capacity of the bus system.

The bus priority systems that are used elsewhere include bus lanes (fully or partly segregated and either 24 hours or at peak periods only), bus-only roads and bus-only signals or signal pre-emption. Typically they also include measures that assist bus services at congested locations and signalised junctions to get ahead of the queuing traffic. Other priority measures to increase operational efficiency of buses include installing bus boarders (extending kerbs so that buses can access a bus stop without leaving its position in the traffic stream) and rationalising the number and locations of bus stops.

Currently there are 14.8km of bus lane within the Greater Kuala Lumpur/Klang Valley - a very low level of coverage for a region of its type. Bus lanes have existed in Kuala Lumpur CBD and came into force in October 1997. They are marked by continuous yellow lines and the words “Bas Teksi Sahaja” along the left side of the road (nearside lane). The start of these lanes is also marked with road signs. The lanes are used by buses and taxis only - no private vehicles are allowed to use them between 0600 and 2000 hours on weekdays (excluding public holidays).
NKRA identified key issues in the Greater Kuala Lumpur / Klang Valley as:

- Other vehicles other than buses and taxis are still using bus lanes
- Vehicles are parked inside bus lanes; obstructing the path of buses and taxis
- Unloading of goods is carried out within the bus lanes
- Buses and taxis are not using bus lanes
- Buses wait for prolonged periods of time for passengers in bus lanes at bus stops and obstruct the path of other buses and taxis
- Traffic police allow other vehicles to use bus lanes during peak hours to alleviate traffic congestion

A further five bus lanes were identified for implementation by the NKRA including:

- ITT Bandar Tasik Selatan - Pasar Seni
- Jalan Genting Klang - Pasar Seni
- Bandar Utama - KL Sentral
- Batu 3 - Pasar Seni
- Jalan Wawasan - Pasar Seni

2.13 Intelligent Transport Systems (ITS)

ITS schemes can be linked to bus priority systems as well. Typically these ITS schemes are electronic information provision used to assist either the service or its users. Typical types of ITS provision include:

- Global Positioning Systems (GPS) - to assist operators in controlling services and drivers during their working day
- In-cab telecommunications - such as radio controls, to notify bus drivers of operational changes or problems on the network or highway
- Real Time Passenger Information (RTPI) displayed at stops, at other premises, in buses or as text messages to cell phones
- Automatic Number Plate Recognition (ANPR) - which is often used to assist bus operators in identifying car drivers who misuse bus lanes and as part of enforcement
- Closed Circuit Television (CCTV); Short Messaging System (SMS) can assist in the dissemination of land public transport information
- Variable Messaging Systems (VMS) - to warn or notify drivers of problems or issues relating to the highway or promote activities relating to the land public transport system such as the availability or capacity of park and ride facilities

Each of these methods of priority or ITS can assist in improving land public transport provision either as a means of providing additional information to passengers, to help operators respond to operating conditions or as a means of enforcing regulations to assist bus services.

The data returned from electronic information provision can be very useful in planning exercises both on a day to day basis and in network planning to develop operational strategies.

There is little in terms of ITS provision in the Greater Kuala Lumpur / Klang Valley region. There is ITS provision in Putrajaya, a freestanding local bus network that has a standalone RTPI system and not a coordinated network of ITS provision which includes for example VMS.

Other forms of assistance are sporadic and are operator based on what they chose to include within their vehicles.

2.14 Publicity And Timetable Information

The publication of conventional bus service timetables with departure times and intermediate timing points is virtually non-existent across the region. Where information is provided at bus stops, it is rarely adhered to. The information that is provided is often out-dated or its quality is insufficient for the users to have any level of confidence to use in determining travel options.

The lack of timetable information serves as a reminder that in a number of instances bus services fail not only to operate in accordance with their licensed requirements, but also do not operate with day to day consistency. Where paper-based information has been posted at bus stops it is typically in the form of schematic bus diagrams with limited supporting timetable information, and when this does exist it solely outlines broad headways or frequencies of principal radial services.

The advent of web based information is slowly improving on the information to be available to public. However, currently, only Rapid KL provides web based information, and this is only in the form of schematic mapping demonstrating where services operate to, with a brief description of each service number and origin and destination.
In studies which have focused on the quality and availability of land public transport information, inadequate or inaccurate land public transport information has been shown to have a demonstrably negative effect, on both the perception of bus services and on ridership levels.

In most developed urban areas, comprehensive and up to date passenger information is available at bus stops, leaflets, and from websites. Commonly it is provided by the transport planning or co-ordination agency. However it is essential that two over-arching pre-conditions are met for this to be successful namely:

- Operators providing services in accordance with their route licenses
- Operators providing SPAD with advanced information about changes they make to services

There appears to be considerable merit in SPAD carrying out an all-operator passenger information exercise in partnership with operators across, bus service corridor or part of a corridor. However, before this takes place it is essential to have established a process of bus service notification to SPAD that includes detailed timetable information.

2.15 On-Bus Information

On bus information falls into three categories:

- Destination displays for waiting passengers
- On-board printed information
- On-board real time information including next stop announcements

This relates to how the bus service is presented to the travelling public and how easy it is to distinguish between individual buses plying a corridor. Existing ‘stopping services’ are categorised as one of four ‘types of services’, which are:

- Utama (U)
- Bandar (B)
- Tempatan (T)
- Ekspres (E)

Service numbers are prefixed by U, B, T or E to denote and identify which category of service it is. The information on the destination display depends on the operator. Generally those who operate a newer fleet of vehicles (such as Rapid KL) have electronic displays and service numbers shown on the front, rear and side of the vehicle. Such displays require a high level of maintenance and can be difficult to read in very bright conditions or for people with impaired vision. Those operators whose vehicles are older, or where the quality of the vehicle is poorer simply display a card or paper destination and number on the interior of the window or on a board identifying the origin, destination and key stopping points of the service.

2.16 Existing Model Of Bus Industry Regulation - Quantity Licensing

The current regulatory model is one which lies between quality and quantity licensing. This is a model which sees the free market (operators) controlling the bus network more than the state government.

With quantity licensing the regulator limits the number of operators and vehicles serving a particular corridor, or places a cap on the total number of operators and vehicles in an area, hence the term quantity licensing. The current model in Greater Kuala Lumpur/Klang Valley sees considerable competition ‘on the road’, and this is reflected in an uncoordinated approach for the delivery of services with buses competing on heavily concentrated radial routes in and out of centre Kuala Lumpur but gaps in the network existing elsewhere, and patchy coverage at times of lower demand.

Whilst quantity licensing can capably deliver a land public transport service, it can often evolve in one of two ways. If operating margins become tighter, it is possible that consolidation of operators within the marketplace may occur and eventually resulting in an effective monopoly. The alternative is that the failure of the state government to regulate adequately may lead to the collapse of the quantity system and potentially lead to an open free-market scenario.

The existing regulatory model is unlikely to support achieving the bus transformation needs or address the problems which currently exist within the industry. The process of transformation needs to be managed effectively to ensure than improved planning and integration can take place.
This existing model does not currently enable such planning and enforcement to take place, thus compounding issues in relation to low quality, network gaps, heavily concentrated bus routes and ineffective coordination.

### 2.17 Process Of Licensing Of Bus Services

The current issue of licensing of bus services within Greater Kuala Lumpur/Klang Valley provides considerable concern. Current licence data is out of date and even where it may be in compliance with the regulations it fails to provide an adequate basis for a bus services database. At present a comprehensive and reliable database of bus service provision is being developed, but the process of developing this is likely to take some time to establish. Moreover it will be necessary to ensure that once it is set up, this database is kept fully up to date. This is best achieved through the establishment of a process through which operators register service details with SPAD in advance of their introduction.

The process of reviewing all licensing data is now ongoing and the process and timeline is shown in Figure 2.8. The process is moving from an existing process; from route based registration to an Operator and Service based registration.

The following diagram (Figure 2.8) outlines the process for licensing moving forward to 2012. This process is currently being rolled out across Malaysia by SPAD to ensure appropriate monitoring of licensing.

![Figure 2.8: The Process for Bus Licensing](image-url)
2.18 Service Reliability And Efficiency

Maximising the reliability and punctuality of existing bus networks can help enhance both their attractiveness and increase capacity. Each bus service which does not operate undermines the attractiveness of the service and reduces capacity. Indeed often it is the uncertainty of services reliability that deters users more than the actual frequency or journey time.

Similarly, poor efficiency will likely to result in poor overall service quality (and potentially volume), the need for higher fares than necessary, as well as worse financial results.

It has not been possible to establish clear benchmarks of existing performance of the bus operators, because registered timetable information is either not provided at the route licensing stage or is not published by the operators, and also because the data collection required establishing a robust view of actual operations is a long term task. One focus of the bus plan must be to ensure that all operators are providing as efficient and reliable services as reasonably practicable, and that this information is displayed in the form of registered timetables, which are available to all.

In the absence of monitoring and benchmarking information it is impossible to judge whether the operators are providing the best possible services at the best value. The lack of robust monitoring also makes it difficult to put complaints into context.

The conclusion is that a system of robust planning, monitoring, benchmarking and reporting needs to be put into place for all bus operations within Greater Kuala Lumpur Klang Valley. A comprehensive timetable notification and variation system needs to be introduced at the earliest opportunity. Then action plans need to be developed to address these weaknesses and to ensure that they are not replicated in the design and planned operation of system enhancements and future bus service.

<table>
<thead>
<tr>
<th>Operations, Regulation &amp; Enforcement</th>
<th>Revenues</th>
<th>Competition</th>
<th>Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>Existing regulatory regime is not conducive for an effective network...</td>
<td>• Insufficient fare box revenue prevent re-investment in new fleet</td>
<td>• Current private operators is unable to compete with RapidKL (GoM owned)</td>
<td>• All agreed that standards of service delivery need to be improved</td>
</tr>
<tr>
<td>• enforcement of regulation (e.g. licenses misuse, fare dodgers)</td>
<td>• Fare controls impede non-fare box revenue</td>
<td>• Smaller operators allege that RapidKL receive financial support from GoM and in direct competition</td>
<td>• All cited highway conditions, congestion levels, etc as major hindrance to improve service delivery</td>
</tr>
<tr>
<td>• regulating issuance of licenses</td>
<td>• Unprofitable route particularly rural areas</td>
<td>• Operators seek “level playing field” for funding and competition</td>
<td>• Insufficient bus stops and priority infrastructure</td>
</tr>
<tr>
<td>• exclusivity of bus lanes and route</td>
<td>• Business loss</td>
<td>• Rapid KL allege license sub-letting that other operators use “pajak” system and franchise routes illegally</td>
<td>• Room for improvement of terminal facilities to facilitate public and bus movement</td>
</tr>
</tbody>
</table>

Table 2.7: Feedback from Operators and Associations
2.19 Stakeholder Engagement

As part of the on-going study, stakeholder engagement with key agencies has been carried out. This included federal agencies, Dewan Bandaraya Kuala Lumpur (DBKL), Selangor State Unit Perancang Ekonomi Negeri (UPEN), Perbadanan Putrajaya, other district local authorities, and transport operators.

Specifically in relation to bus services within the region; principal operators, transportation trade associations and other bodies have been included within the stakeholder engagement process and they have provided valuable input and data to inform the process for change.

From this process, the following have been identified:

- Key concerns and issues
- Stakeholder’s plans and proposals for the future
- Range of data (land use information, bus network data, traffic counts and journey time data).

Table 2.7 identified a number of the key concerns that have been highlighted by bus operators and associations during the stakeholder engagement process. The principal concerns have been grouped by four main categories, with each category containing the key contributing factors for issues within the current industry.

2.20 Public Concerns

Public feedback on bus services have been obtained through examination of recent customer complaints and the latest Pemandu Q3 2010 NKRA Baseline Survey. The survey assessed land public transport users’ satisfaction levels with the service they received. Figure 2.9 shows 38% of bus users found the service provided satisfactory and a further 46% found it acceptable. Bus users displayed the second lowest satisfaction levels behind KTM users. It is recognised that these figures only represent service users and in order to understand satisfaction levels across the wider population it is important to undertake wider reaching public attitude surveys with both service users and non-users. It is likely that a satisfaction measurement which includes non-users will therefore be lower meaning that overall satisfaction levels are likely below the current 85% quoted.

![Figure 2.9: Land Public Transport User Dissatisfaction Levels](Source : Pemandu Q3 2010)

Key issues identified by the public included:

- Punctuality
- Waiting time
- Travel time
- Accessibility
- Bus condition
- Interchange
- Bus driver attitude
- Information

Key contributing factors to bus problems faced by the public are:

- Road congestion (no dedicated lanes)
- Old or not well maintained vehicles
- Lack of proper network planning
- Lack of proper planning of first and last mile travel
### Key Conclusions

It is generally agreed that the current delivery of bus services across the Greater Kuala Lumpur/Klang Valley region is lacking in a number of areas.

Quality of provision is often poor. Network coverage and availability leaves large gaps in the network and the distribution of land uses and the form of the highway layout militate against effective bus operation. Passenger information, when available, is often low quality, minimal information that compounds the poor service reliability. Priority measures to help improve reliability and journey times are neither widespread nor effectively enforced.

There is currently no mechanism for coordinated, integrated planning in the provision of bus services. A consequence of this lack of planning is the need for commercial operators to maximise revenues. This results in heavy concentrations of bus services on key radial routes.

The existing service pattern focuses on central Kuala Lumpur and is principally concentrated on the main corridors of movement where a high frequency level of service can be found. These tend to be radial routes emanating from Kuala Lumpur where operators are likely to experience high ridership and levels of revenues.

There is very little penetration of residential areas and the analysis indicates that very large numbers of people are not within a reasonable walking distance of a bus service.

In addition to the lack of planning, it is also generally agreed that there is a lack of integration both between different bus services and between bus and rail. A better planned and coordinated approach to bus service provision is crucial to successful future development, and in particular to ensure that bus services complement the expanded rail provision.

The shortfalls in planning, monitoring and enforcement result in a network which is not integrated; does not meet the needs of the travelling public; duplicative competitive operation by operators, and fails in meeting government policies and objectives.
LOOKING TO THE FUTURE OF BUS
3 LOOKING TO THE FUTURE OF BUS

3.1 Introduction

This chapter outlines the vision for the Greater Kuala Lumpur/Klang Valley bus industry. As such this is led by the objectives and guiding principles for the Master Plan set out in Chapter 1. The Master Plan defines a 20 years plan for the land public transport system of the region which meets the vision of establishing land public transport as the first mode of choice. The Master Plan has established a process of identifying the selection of appropriate transport modes for different corridors. In order to meet the public’s aspirations there are a series of requirements that bus services should meet to achieve the appropriate standard. Chapter 4 sets out more detail on the proposals of the BTP.

Figure 3.1: Relationship between National Vision/Objectives and the Greater Kuala Lumpur/ Klang Valley Master Plan
Chapter 2: Bus Transformation Plan

3.2 Vision For The Region

Chapter 1 outlined the SPAD Vision for land public transport in Malaysia. The National Land Public Transport Master Plan provides a series of guiding principles and a Planning Guidelines to assist the development of Regional Master Plan such as that for the Greater Kuala Lumpur/ Klang Valley region. The latter is also informed by the policies of the DBKL City Plan for Kuala Lumpur and the Selangor Structure Plan and leads to the development of a 20 years Master Plan for the region. The Greater Kuala Lumpur/ Klang Valley Master Plan also builds on the work undertaken for the NKRA. The latter set a short term programme of initiatives to 2012 to improve land public transport in the region. The Master Plan seeks to build and expand on these into a 20 years plan. Figure 3.1 shows the relationship between the National Land Public Transport Master Plan and the Master Plan.

The vision for the Greater Kuala Lumpur/ Klang Valley region recognises the need to facilitate economic growth created by the land use plan which will increase travel demands in the region and also increase congestion if measures to enhance land public transport are not undertaken. This leads to the vision that for the region ‘land public transport should be seen as the first mode of choice for a journey’.

The mechanisms to achieve the regional vision are set out in the Greater Kuala Lumpur/ Klang Valley Master Plan. These also respond to the quality aspects that the public would wish to see to allow them to choose land public transport first. For the bus industry in particular, the public’s requirements for the service determine the standards that are needed for service and therefore the regulatory regime that is required.

3.3 The Greater Kuala Lumpur/Klang Valley Master Plan

The development of the Greater Kuala Lumpur/Klang Valley Master Plan has followed a series of logical steps as set out in the National Land Public Transport Framework and which are detailed in the BTP. The scenarios considered in developing the Master Plan have taken account of the transit gaps that are not served by existing rail services and the future land use patterns identified by the local authorities. The impact of land use is considered in terms of population and employment and how this impacts upon travel demands. The transport analysis tools assess the future travel patterns and demands particularly along the corridors in the Greater Kuala Lumpur/Klang Valley region. These are compared against a corridor hierarchy based on peak passengers PPHPD. The tools provide methodologies to assess the impacts of alternative options within and between corridors. From this basis preferred corridors were identified for improvement and the proposals for the Master Plan assembled. At the same time, appropriate standards based on the public’s requirements for a service have been defined.

3.4 Future Land Use Demands

Data have been collated from the local authorities in relation to the DBKL City Plan, the Selangor State Structure Plan, Putrajaya Master Plan and local district plans. The latest versions of the plans have been reviewed to identify their data, land use policies and development proposals. From this basis, the transport recommendations of the Master Plan are developed using an independent systematic and methodological approach as outlined in this chapter. This allows consistency and integration of the land public transport elements of the Master Plan with the development aspirations of the land use plans.
The population forecasts assume a capacity of 10 million people in the region with the largest growth forecast in Klang, Sepang and Putrajaya. This is a 59% increase in population compared to 2010. The population density map for 2020 (see Figure 3.2) is similar to that for 2010 with higher densities in the main suburbs of Kuala Lumpur and the regional centres such as Shah Alam. There are a number of major residential developments proposed within the land use plans which need to be incorporated into the Master Plan. The household size projections within the plans are forecast to drop further to 3.93 persons per household in 2020, representing a further increase in the rate of household formation and thus the demand for new housing units. This growth will maintain the pressure on the transport networks with increased demand for movement across the region.

The draft DBKL City Plan forecasts the growth in jobs from 729,000 in 2005 to 1.2 million in 2010 and 1.4 million in 2020. The City Plan shows great intensification particularly in the Kuala Lumpur city centre. There are a number of major commercial developments within the land use plans which need to be integrated into the Master Plan (Tun Razak Exchange (TRX) and Matrade). The growth in these locations will intensify the need for high capacity land public transport for their own success and to maintain the economic status of the region. In particular, enhanced rail systems need to provide access to the centre of Kuala Lumpur.

Figure 3.2: Population and Employment Densities 2020
(Source: Halcrow)
Key Conclusions

Population will continue to grow in the region, increasing the demand to travel.

Employment intensification is proposed in key centres, particularly in centre Kuala Lumpur.

The concentration of employment will be more and more difficult to serve without major increases in land public transport mode share.

Employment areas will need good accessibility to maintain the economic status of the region.

3.5 Future Travel Demands

A series of transport analysis tools have been developed to assess the key considerations of land use and transport schemes on future travel demands, travel times and accessibility. The tools include:

- Land use database which utilises the data provided by DBKL, Selangor UPEN, Perbadanan Putrajaya and local district plans
- Trip generation model which uses the land use information to derive the forecast travel demands in the region
- Multi-modal transport model which derives the future travel patterns on the network in terms of flows, and travel times
- Accessibility model which shows the impact of travel times on access to locations within the study area for catchment area analysis

Forecasts have been produced for the morning peak 2020 situation with those committed schemes and the MRT1 rail line. The forecast of morning peak hour travel demands by all modes (private and land public transport) in the region, show a large radial movements towards the central Kuala Lumpur (see Figure 3.3). Demand for all modes crossing the Middle Ring Road (MRR) 1 as forecast for 2020 shows strong flows in all the corridors with the highest demands being from the Petaling Jaya/ Shah Alam/ Klang corridor.

Within the region there are also strong orbital demands in the suburban areas (see Figure 3.4), particularly to areas such as Petaling Jaya and Shah Alam. The largest flows are in the Petaling Jaya area along corridors such as the North-South Expressway and the Damansara-Puchong Expressway (LDP) corridor. In addition to these flows between centres, there is a wide diversity of local movements within the suburban areas such as local movements within Shah Alam or Klang. Although lower than the radial demands into the centre Kuala Lumpur, these demands require high quality land public transport access.
Chapter 2: Bus Transformation Plan

Figure 3.3: Forecast Travel Demands towards central Kuala Lumpur (Morning Peak)

Figure 3.4: Forecast Travel Demands Orbital Movements (Morning Peak)
Without improved land public transport and mode shift to land public transport, the net result of the growth in travel demands arising from the land use changes will be further increased private vehicles usage. This will lead to longer travel times with a further significant rise in congestion for private vehicles as well as buses leading to unreliable travel times. This will affect the commercial performance of the region. The forecast 2020 travel times to the centre Kuala Lumpur clearly show the lengthening of private vehicle journey times with more areas in red (see Figure 3.5) and much fewer areas of blue.

A similar comparison for land public transport shows travel times will improve along those corridors with the commitments (more green areas) which include the LRT extensions to Putra Heights (see Figure 3.6) as well as the MRT1 line through Damansara and Cheras.

Figure 3.5: Modelled Perceived Travel Times by Private Vehicle to Centre Kuala Lumpur
(Source: Greater Kuala Lumpur/ Klang Valley Transport Model)
Figure 3.6: Modelled Perceived Travel Times by Land Public Transport to Centre Kuala Lumpur
(Source: Greater Kuala Lumpur/Klang Valley Transport Model)
Key Conclusion
The increase in population and employment will increase travel demands.
This will put further pressure on the highway network with resulting congestion and unreliable journey times.
Land public transport accessibility is improved along the LRT extension corridors and the MRT1, but significant areas remain without good accessibility.
Overall accessibility will worsen unless additional land public transport supply is provided.

Mapping overall accessibility to employment shows a much wider area of blue with improved accessibility (see Figure 3.7). The areas of improvement follow the LRT extensions and the MRT1 line through areas such as Damansara, Cheras and Kajang. However the figure does confirm that significant gaps remain such as Mont Kiara and along the Klang Valley and that the committed schemes alone do not provide high quality land public transport services to all parts of the region. The conclusion is that further measures are needed.

Figure 3.7: Modelled Accessibility Index 2020
(Source: Greater Kuala Lumpur/ Klang Valley Transport Model)
3.6 Modes

Land public transport covers a wide range of modes from different types of bus and rail system. Each has different key characteristics in terms of PPHPD, average speed, technology and operating considerations. Buses typically operate at lower speed and are more likely subject to congestion thus impacting the reliability and ability to operate according to timetable. There is often the potential to implement bus priority measures which provides flexibility to respond to changes in demand and network characteristics. It provides a much lower capacity compared to rail systems but operate with lower costs where lower capacity is required, flexible to changing demand and can provide services close to most developments. As such, buses are more suited to feeder corridors and local/district network.

In addition to feeder bus service provision, BRT systems can operate with a range of vehicle types from single deck buses carrying 70 passengers up to articulated vehicles carrying 300 passengers of which the majority will be standing. These rely more on segregated sections of carriageway in order to provide relief from congestion and the highest capacity BRT vehicles cannot easily operate in mixed traffic conditions. They can play a role in local corridors and also on secondary corridors. The capacity provided is a function of the headway and vehicle types. This will determine the amount of carriageway required for BRT services. High frequency services, such as in Latin America, China or India typically require more running lanes. With transit stations, they can require the equivalent of a five lane highway and are thus very demanding of infrastructure needs particularly in corridors that already include complex road networks that BRT needs to fit alongside.

![Figure 3.8: Relating the Modes to Conceptual Corridor Hierarchy](image)

Note:
* The distances shown are indicative and set in the context of the Greater KL / KV
* The actual distances may vary by corridor and be dependent on the local circumstances including (but not limited to topography, engineering, demands and scheme costs.)
3.7 Corridor Hierarchy

The approach to the Master Plan development is to investigate the corridor hierarchy in the region and from this to select the appropriate modes where enhancement is needed. Four levels of corridor are identified; primary, secondary, feeder and local/district corridors. In the context of Greater Kuala Lumpur Klang Valley, these are distinguished within a functional hierarchy and are based on PPHPD (see Figure 3.9).

The conceptual diagram of how the corridors fit together shows that at the top level of the hierarchy are the primary corridors. These are identified as corridors with the highest demand (in Greater Kuala Lumpur/Klang Valley over 25,000 PPHPD). These will typically be linkages to city centres potentially from other suburban town centres. At the levels of demand in Greater Kuala Lumpur Klang Valley, high quality rail-based systems are likely to be justified. Transit stops along the primary corridors would be served by a walking catchment (potentially up to 400 metres if outdoors and over 400 metres if indoors be further apart than on other corridors reflecting the need to serve the city centre. Transit stops would generally also be supported by a feeder bus network.

Secondary corridors can serve a range of functions such as lower demand corridors to a city centre or in providing linkages to a primary corridor. In Greater Kuala Lumpur/Klang Valley they will have demands in the range 5,000 to 25,000 PPHPD and this will, in some cases, be sufficient to justify rail-based systems while in others a high quality bus solution may be more appropriate. Transit stops might be closer together on the secondary corridors served to increase walking and bus catchments.

The feeder services are crucial to support the primary and secondary corridors as these provide access to these services. Finally there are local corridors which access other local centres, which will generate significant demands in their own right. Often the same routes will be able to provide feeder and local network functions. Feeder services and local corridors are likely to be bus based, with the maximum practicable priority to minimise journey times and unreliability.

Street trams by comparison can operate within traffic lanes or segregated from traffic, and are extensively used in Western Europe. Where they operate with traffic and pedestrians, the speed is lower and can be subjected to delay. In developing a network, as the system is at grade, there may be significant disruption through accommodation works for utilities during construction to avoid operational disruption. The capacity of tram systems is not as large as for a monorail due to operational characteristics, but the infrastructure costs are lower.

Whilst such rail systems can provide similar levels of capacity to BRT and are segregated from traffic using elevated sections, they require sophisticated signal and control systems to operate at high frequency. Monorail systems have limited interoperability and it is not as easy to switch tracks as with conventional rail systems.

In addition to street-running rail systems, the highest capacity corridors are often provided by heavy rail - LRT, MRT or commuter rail systems.

In developing the Master Plan, the role of each of the modes has been carefully considered according to the local requirements. A separate study into the implementation of a series of BET, BRT and Bus Lanes, is being developed in addition to this BTP. This separate study will determine the potential and opportunity for BRT provision within Greater Kuala Lumpur/Klang Valley as a high level study. It will identify potential routing options, integration modes, corridor constraints and a series of high level operating and capital expenditure costs associated with operation.

Key Conclusion

The assessment process needs to consider the role of each mode such that the growing travel demand can be met by the appropriate mode.

In the case of Greater Kuala Lumpur/Klang Valley, the assessment process showed that meeting the growing travel demand can be best achieved through a combination of solutions most appropriate to the needs of the individual corridors and areas served.
Chapter 2: Bus Transformation Plan

3.8 Corridor Hierarchy And Local Network Provision

In developing a future vision for bus based land public transport provision it is important to understand that these conceptual corridors and the processes necessary to develop them will generate a series of ‘local bus networks’.

It is important that in developing ‘corridors’ that these corridors are then integrated to form a network of local bus services, which integrate with one another to ensure that a joined up network of services exist to meet passenger demand and the needs of the users. Of equal importance to the services themselves is the approach taken to the measures that result in a truly integrated land public transport network across all modes, including ticketing arrangements, passenger information and signage.

These local bus networks will consist of a series of local bus services, feeder services, main road corridors (or trunk corridors). It is important that this hierarchy of services will need to be delivered to meet the demand for the region, and that each level of service will have an integrated part to play in bus service delivery.

Figure 3.9: Conceptual Corridor Hierarchy
3.9 The Greater Kuala Lumpur/ Klang Valley Corridor Hierarchy

The corridors in the Greater Kuala Lumpur/ Klang Valley have been identified in terms of their roles in the hierarchy. The forecast demands identified in Section 3.5 were based on all modes (private and land public transport) for each corridor. The morning peak demands were converted to a land public transport PPHPD which assumes a 50:50 split between land public transport and private transport reflecting longer term aspirations for modal share in the region. It is noted that for some corridors a higher modal share will be achievable.

- The primary corridors cover each of the main entries into the centre Kuala Lumpur. Rail provides the main mode in the majority of these corridors.
- The secondary corridors comprise the linkages to other key centres such as Klang, Shah Alam, Petaling Jaya and Putrajaya.
- In addition to the primary and secondary corridors there are extensive feeder and local/district corridors which are shorter in length and provide local access to centres and the other corridors. These are served by the bus network.

In the case of Kuala Lumpur, the assessment process showed that meeting the growing travel demand can be best achieved through an integrated combination of solutions most appropriate to the needs of the individual corridors and areas served.

3.10 The Role Of Modes In Greater Kuala Lumpur/ Klang Valley

Having defined the hierarchy, the roles of each mode in the Greater Kuala Lumpur/ Klang Valley in the future can be summarised in Figure 3.10. Urban Rail can be defined as providing the spine to the future transport system, particularly in providing the high capacity linkages between the suburbs and the centre of Kuala Lumpur. This will be undertaken through enhancement to existing lines, network extensions and the provision of new routes. Bus will provide the role of supporting and feeding the transport system. Bus services will fill in the gaps of the rail network, particularly on secondary corridors and on routes to the centre of Kuala Lumpur not served by rail. Where appropriate these secondary corridors will use BET and BRT. To support the primary and secondary corridors, a network of feeder buses linking with local interchanges on the trunk network should be provided to ensure wider connectivity. Bus services will also provide local services to suburban centres in their own right. Finally in the context of Greater Kuala Lumpur/ Klang Valley, taxis will fill in the gaps in space and time and provide a quality door to door service.
3.1.1 The First And Last Mile

The bus element is only one part of the passenger journey. Integration with other modes (land public transport, private transport, walking and cycling) is important to maximise the potential usage of bus, where this can be referred to as the ‘first and last mile’, which encompassing initial access to the services, any interchange requirements and the final access to the destination. The requirements for the ‘first and last mile’ will vary between the different modes. The Interchange and Integration Plan (IIP) considers these requirements in more detail.

Integration requires:

- Easy and direct walking and cycling access routes including consideration of covered footways where appropriate, and road-crossing facilities either at-grade or above/below ground
- Network of feeder bus services to provide linkages to stations
- Good, well designed interchange facilities between modes to reduce the ‘barrier’ of changing modes
- Facilities include systems to provide real time passenger information on the availability of land public transport services
- Local information (maps) to show local facilities, and access routes
- Stations and their accesses equipped with proper lighting and close circuit security systems
- Stations include cycle and motorcycle parking facilities
- Integrated ticket systems introduced to allow users to use one ticket/smart-card which can be used on all modes without having to buy another ticket at an interchange location
- Encourage longer term land use and transit oriented developments to allow housing and commercial developments close to the stations, which will encourage use of land public transport

Figure 3.10: Conceptual Roles of the modes in Greater Kuala Lumpur/ Klang Valley
Chapter 2: Bus Transformation Plan

3.12 Success Factors For Developing The Bus Network

This chapter has summarised the background to developing the BTP based on defining the role of bus in the context of the Greater Kuala Lumpur/Klang Valley region. The success of the plan draws upon:

- Feedback from users and stakeholders (Outlined in Chapter 2)
- Defining the vision for land public transport and the role of bus (Outlined in this chapter)
- International best practices

The keys to success of bus services in the region will be (see Figure 3.11):

- Punctual and reliable services which are attractive to users
- Good access to system “first and last mile” through the provision of good pedestrian access
- Integration within the overall land public transport system to provide wider network coverage
- Competitive journey times via land public transport which are attractive to encourage modal transfer
- Comfortable modern vehicles and well-trained drivers so that bus system provides a quality service
- Good (accurate and up to date) passenger information systems that enhance users experience
- Safe and secure journeys for users
- Fare system which provides an appropriate fare level and integrated with other land public transport modes
- Sustainable industry that the network allows the industry to operate, develop and invest for the future

Figure 3.11: The First and Last Mile
The current status of the bus system in relation to the success factors is shown in Table 3.12. This shows that the existing service does not deliver on any of the critical key success factors. However, a key major issue to note is the lack of the data and understanding. Therefore a monitoring framework associated with Key Performance Indicators will need to be developed as part of the BTP.

**Table 3.12: Key Success Factors and the Current Status**

<table>
<thead>
<tr>
<th>Key Success Factors</th>
<th>Current Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Punctual &amp; Reliable Services</td>
<td>Services perceived as unreliable</td>
</tr>
<tr>
<td>Good Access to system “First &amp; last mile”</td>
<td>Lack of access to bus network is a deterrent</td>
</tr>
<tr>
<td>Coverage: Integrated with overall PT system</td>
<td>Poor integration between services &amp; modes, 63% within 400m</td>
</tr>
<tr>
<td>Competitive Journey Times</td>
<td>Bus speeds considerably slower than car - 9 - 15kph in peak</td>
</tr>
<tr>
<td>Comfortable Vehicles &amp; Well-trained Drivers</td>
<td>Mixed standard of vehicle fleet and service level</td>
</tr>
<tr>
<td>Good (accurate, up to date) Passenger information systems</td>
<td>Limited timetabling Limited to no passenger information</td>
</tr>
<tr>
<td>Safe &amp; secure journeys</td>
<td>Poor perception of security</td>
</tr>
<tr>
<td>Fares - Level &amp; Integration</td>
<td>Some variation in fare charged No integrated fares</td>
</tr>
<tr>
<td>Sustainable Industry</td>
<td>Appears to be loss making</td>
</tr>
</tbody>
</table>

These success factors determine the focus for the elements to be incorporated into the BTP. These elements include:

- Bus Network
- BRT
- Regulatory framework
- Other initiatives (including quick wins)

The next chapter provides more details on these elements and how they develop from the NKRA initiatives.

**Key Conclusions**

The range of primary and secondary corridors has been defined for the Greater Kuala Lumpur/ Klang Valley region.

Secondary corridors (BRT) focus on orbital movements and the other centres.

Feeder services will ensure that there are linkages between local centres and provide links to main road bus services (including BRT) and to rail services.

The assessment process needs to consider the role of each mode such that the growing travel demand can be met by the appropriate mode.

Bus will provide the role of supporting and feeding the transport system.

Bus services will fill in the gaps of the rail network, particularly on secondary corridors and on routes to the centre of Kuala Lumpur not served by rail.

Where appropriate these secondary corridors will use BET and BRT. To support the primary and secondary corridors, a network of feeder buses should be provided to allow connectivity.

Bus services will also provide local services to suburban centres in their own right.

The success of the plan draws upon feedback from users and defining the vision for land public transport and the role of bus (outlined in this chapter) and International best practice.
Chapter 2: Bus Transformation Plan

4 DEVELOPING THE FUTURE BUS NETWORK
4 DEVELOPING THE FUTURE BUS NETWORK

4.1 Introduction
This chapter outlines the process of how to move from the ‘existing provision’ of bus services to a ‘future provision’ and how that can be achieved. The process of developing the bus network will need to recognize the role of bus services in the integrated hierarchy of land public transport provision in Greater Kuala Lumpur/Klang Valley and address both the way in which bus service provision integrates with present and enhanced rail services and the process of bus service adaptation to meet the phased introduction of MRT and BRT lines.

4.2 The Elements Of The Bus Transformation Plan
The previous chapter outlined the success factors needed to enhance the bus network in the Greater Kuala Lumpur/Klang Valley. These lead to the elements that should be incorporated into the BTP. These include:
- Bus Network
- BRT
- Regulatory Framework
- Other initiatives (including quick wins)

![Hierarchy of corridor demand](image)

**Figure 4.1: Bus within the Hierarchy of Corridor Demand**

<table>
<thead>
<tr>
<th>Role of Bus</th>
<th>BRT</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Fill in the gaps of rail network, i.e. secondary corridor demand</td>
<td></td>
</tr>
<tr>
<td>• Feeder bus services to provide quick connection to primary &amp; secondary corridors</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Role of Bus</th>
<th>BUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Feeder bus services to provide quick connection to primary &amp; secondary corridors</td>
<td></td>
</tr>
<tr>
<td>• Provide local network for local demand and fill in the gaps in the overall network</td>
<td></td>
</tr>
</tbody>
</table>
SPAD will plan and regulate a network and service provision that meets the public’s expectations and the requirements of the industry. To achieve this will require a greater deal of regulation and supporting enforcement than currently exists in the Greater Kuala Lumpur/Klang Valley region. The next chapter outlines how the BTP meets these regulatory requirements and what can be undertaken to achieve the public’s expectations.

4.3 Defining The Bus Network

Integration of future bus planning with the existing and future rail provision, together with BRT systems will be essential. It is essential that bus routes are planned to complement the rail and BRT network with buses utilised to extend the coverage of the network and generally feed into the primary and secondary corridors rather than compete in the same corridors for the same users. Since the new rail or BRT initiatives will be introduced in stages it is vital that the planning and regulatory arrangements for the bus network that complements these higher level modes allows for a staged introduction of changes to the bus network.

Figure 3.9 identifies how the role of the bus relates to other modes in a conceptual corridor hierarchy of land public transport provision. Within this, Figure 4.1 demonstrates the hierarchy of corridor demand and the levels of PPHPD, expected to be transported by bus, representing the role of the bus in this hierarchy.

In this corridor hierarchy, it is suggested that BRT corridors - as secondary corridors - will operate with patronage greater than 5,000 PPHPD, but with less than 25,000 PPHPD; and that bus services operating either as feeders or as local or district services would operate with up to 5,000 PPHPD.

In general, the provision of bus links to rail services can be considered in a number of ways - by type of station catchment area, station design, or bus service and ideally on a station-by-station basis. However, there is a clear need to put in place adequate accessibility to the rail network by bus where parts of the defined catchment are beyond reasonable walking distances. When local topography and highway factors are considered on an area by area basis it may be that feeder links are better provided to a nearby interchange location though not necessarily the nearest one to a particular area.

The overall approach of course assumes all parts of the catchment are capable of generating sufficient patronage to economically justify the provision of a bus service. However this will not always be the case either at all, or in the early phases of a developing area when demand will be lower but when a feeder link should be provided to ensure that the population gets the land public transport “habit”. All bus services can be categorised according to a number of basic types, with variants occurring within types, as follows:

- **Intercity Bus or Express Services** - Likely to have a limited number of stopping points to produce an attractive overall journey time for passengers, usually not operating to a high frequency but often have a higher degree of comfort than other services;
- **BRT** - provides higher capacity service along a corridor, often as an intra-urban express service on dedicated rights of way
- **Urban Bus Services or Bus Express Transit** - Can be both limited stop and all stops, more usually the latter. Often operate to a high frequency to be attractive to passengers, can have high capacities/limited seating. Operate primarily on a radial basis from centres or to a lesser extent on an orbital basis; and,
- **Feeder Services or Local Services** - operates to link residential areas to nearby transit stations for rail and BRT; or operates to local centres or into the centre of nearby towns or cities at medium to high frequencies. Often providing a first/final link in a ‘chain of journeys’ involving interchange to other bus services or other transport modes, and may also act as feeders jointly.

There is also a fifth category of provision. Known as “Para transit” it comprises flexibly routed on demand services that typically operate at times of very low demand or to and from areas of very low density. In the Greater Kuala Lumpur/Klang Valley context
such provision may be provided by the taxi trade acting in their regular for hire mode or under specific contractual arrangements to provide, for example, very early or late links to a rail interchange.

These types do not necessarily relate to the size or characteristics of the vehicles that may often be employed on these service types. Feeder services may, for example, be operated by smaller buses of lower capacity than those provided on main road routes in order to better penetrate residential areas, but this does not have to be the case. There are many instances of feeder services being provided with full size vehicles, also of main routes being operated by a high intensity service of smaller vehicles. Each case will need to be judged on what is appropriate to the local circumstances, but always recognising that operating commuter or local services at low frequencies is generally not attractive to users.

Building on the points which are shown above, Figure 4.2 identifies in more detail the hierarchy and scope of services that could be implemented within the Greater Kuala Lumpur/Klang Valley region.

### Figure 4.2: Hierarchy and Scope of Bus Services

<table>
<thead>
<tr>
<th>Hierarchy of Bus Services</th>
<th>Scope of Service</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inter-City or Express Services</td>
<td>• Longer haul bus services connecting between major cities;</td>
</tr>
<tr>
<td></td>
<td>• Ensure connectivity between smaller cities &amp; the more developed commercial cities;</td>
</tr>
<tr>
<td></td>
<td>• High headways as it focuses on particular demand;</td>
</tr>
<tr>
<td></td>
<td>• Focus more on origin-destination passengers</td>
</tr>
<tr>
<td>BRT</td>
<td>• Integrated &amp; cost-effective system;</td>
</tr>
<tr>
<td></td>
<td>• High capacity vehicles operating within dedicated lanes;</td>
</tr>
<tr>
<td></td>
<td>• Stops and stations for easy passenger access;</td>
</tr>
<tr>
<td></td>
<td>• Integrated management system</td>
</tr>
<tr>
<td>Urban bus Services or Bus Express Transit</td>
<td>• Move a large portion of the commuting population in and out of the city with a high throughput;</td>
</tr>
<tr>
<td></td>
<td>• Providing mixed short distance and long distance services;</td>
</tr>
<tr>
<td></td>
<td>• Providing a variety of service classes</td>
</tr>
<tr>
<td>Feeder Services or Local Services</td>
<td>• Provide linkages between suburban areas &amp; local centres</td>
</tr>
<tr>
<td></td>
<td>• Provide links between suburban areas and rail/BRT corridors</td>
</tr>
</tbody>
</table>
4.4 Defining The Standards

While defining the network of services is critical, so is providing services on those routes that are attractive with appropriate quality.

A key issue being considered is to ensure that services operate reliably and with the best practicable journey times. As discussed this requires wherever feasible bus priority measures to minimise the effects of congestion and speed journeys and to make the operation of services as cost-effective as possible. It also requires good access into and through developments. From the operator’s perspective, it demands efficient and effective management and control of services to ensure staff deliver the services reliably.

However it is not enough to simply run reliable services as users demand quality. In defining the further standards relating to bus service provision, it is important to address and provide solutions to alleviate those concerns and issues which currently exist within the current network.

The diagram shown in Figure 4.3 identifies the key components which need to be considered when defining an improved network of bus services. The diagram identifies those measures which would need to be addressed in order to meet the standards pertaining to the operations, vehicles and infrastructure provision.

It is these elements which would need to be specified, when defining the bus industry going forward. These standards would need to be considered for all types of bus services provision, including BET, BRT, Feeder and local services. It is important to note that whilst many of the standards require action by the operators and are under their direct control, there are some aspects for example; infrastructure provision, bus priority measures, and supportive travel demand management measures that require other bodies or authorities to take complementary actions. These are best achieved through a partnership approach involving a range of key stakeholders.

### Figure 4.3: Bus Service Standards

<table>
<thead>
<tr>
<th>Infrastructure</th>
<th>Service Quality</th>
<th>Comfort</th>
<th>Safety &amp; Security</th>
<th>Environment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stops and shelters; Local Walk routes &amp; signage; Major interchange; Local hubs; Bus lanes and priorities</td>
<td>Convenient access; Air conditioned shelters; Comprehensive Information; Vending concessions</td>
<td>Well lit &amp; secure shelters; CCTV; Communication &amp; Information; Cultural aspects/requirements for women</td>
<td>High standard cleanliness &amp; maintenance; Quality design &amp; materials; Sustainable energy sources</td>
<td></td>
</tr>
<tr>
<td>Low floor; Bus capacity adequate to routes</td>
<td>Air Conditioning; Headroom; Aisle width; Seat pitch; Handrails</td>
<td>Emergency exits; Driver’s Cab; Fire extinguisher; First aid kit; Cash safety &amp; handling</td>
<td>Emission standard; Fuel efficiency</td>
<td></td>
</tr>
<tr>
<td>Frequency; Service spread; Fare structure/Integration; On board info; Timetable available</td>
<td>Walking distance to bus routes/ stations; Driving quality &amp; standards; Driver customer care standard</td>
<td>Maintenance programme</td>
<td>Bus Rapid Transit (BRT)</td>
<td>Urban bus services or Bus Express Transit</td>
</tr>
</tbody>
</table>
4.5 Bus Rapid Transit

A series of potential BRT corridors have been identified through the demand modelling exercise which has been carried out for the Greater Kuala Lumpur/Klang Valley Master Plan. The study has identified potential BRT corridors based on current and projected travel demand. The level of demand determines the most appropriate mode of transport as indicated in Chapter 3. The proposed BRT corridors have been selected to support the future rail network and also to provide additional services on corridors where there are currently no proposals to implement rail facilities. BRT will also be used to provide orbital routes linking key district centres and provide commuters with the opportunity of travelling between residential and employment areas without the requirement to travel into the centre of Kuala Lumpur to complete their journey.

There is no single, universally agreed, definition of what constitutes BRT. The term can refer to very high capacity, high frequency bus services, using up to 300 passenger capacity buses operating on fully segregated bus roads, often within a wide highway alignment. More conventionally, as in many European and Australasian situations, similar to Kuala Lumpur, it is typified by a package of measures, which include:

- Some degree of alignment (infrastructure) dedication that may include a complete or partial segregated alignment either as part of the highway or as new build
- Possibility of bus guidance using kerb guidance, electronic or optical guidance
- Utilising re-allocated road space in the form of 24 hour or peak time bus lanes, usually identified through coloured road surface, specific road markings and signage, sometimes supported by signalisation
- Traffic signal priority.

Figure 4.4 shows the potential BRT corridors for the Greater Kuala Lumpur/Klang Valley region. These are a mix of radial and orbital corridors.
Figure 4.5 shows a typical conceptual alignment for a BRT corridor between the two terminal facilities. Transit stops are identified at appropriate locations within the corridor. However, the distance between stops is very dependent on the nature of the corridor and the trip attractors. Where appropriate local feeder services will provide access to the BRT service.

The types of BRT options include:

- Implementation of bus lanes - effect removal of a traffic lane for general traffic, which will have an impact on capacity. The impact of this can be reduced by introducing peak hour restrictions which will allow buses to utilise these lanes during peak operating hours but will allow general traffic outside of peak hours. The peak hours can be defined by corridor or standardised throughout Kuala Lumpur.

- Re-allocation of Road Space - provision of 24 hour or peak hour bus lanes on existing highway is the quickest option available for providing bus priority. It is particularly appropriate in restricted urban environments where land availability is limited and the options for providing elevated sections are restricted through no central median to construct the relevant support, or existing elevated highway which limits opportunities for bus corridors.

- Reallocate road space - involves the establishment of bus advance signals which is typically traffic signals at the end of a bus lane that allow buses to get in front of a queue of traffic in order to pass through a part of the road network that is too narrow to accommodate a bus lane or that has other constraints such as on-street parking or premises serviced from the highway;

- Dedicated Bus way - this option is the most suitable for full scale bus priority as it allows uninterrupted bus passage from its point of departure to its destination. The works associated with these measures are typically new build highway, either elevated or at grade, where land availability permits. These measures have been considered when reviewing the proposed corridors and consideration has been given to the requirement for additional land to facilitate the measures required to provide dedicated facilities. Feasibility design, followed by detailed design will need to be completed for each of the identified BRT corridors to establish third party land ownership issues, to secure suitable permissions from relevant highway authorities and go through the processes necessary to acquire third party land or the right to use it.
The assessment of the order of implementation of potential BRT corridors took into account:

- Corridor demand
- Ease of implementation
- Transport integration
- Land use integration
- Potential impact on general traffic

In assessing the proposed corridors, the Master Plan has identified the potential opportunities and constraints associated with the implementation of BRT measures as outlined above. A more detailed design study will be required to take the corridors forward, including a full topographical survey of all corridors to be undertaken to establish available carriageway widths and opportunities for utilising highway verge. The requirement for third party land will prove to be critical in providing continuous priority for BRT services. From advice received from key stakeholders who have been consulted as part of the BRT study, the procurement of this land can be time consuming and costly; a process with difficult situations could take a number of years to resolve, typically three to four years.

The assessment identified the time frame for implementation which led to the priority order as shown in Figure 4.6. The first two corridors to be assessed for detailed design are part of the priority 1 identified as Kuala Lumpur - Klang and Kuala Lumpur - Taman Melawati corridors.

In developing the BRT network there are a number of associated initiatives which are outlined in a later section.
4.6 Planning The Local Bus Network

Chapter 2 outlined the current network in Greater Kuala Lumpur/Klang Valley where the focus is currently on providing services to centre Kuala Lumpur. During the Master Plan there will be a radical transformation of the overall land public transport network as the rail network develops and the role of bus evolves with that development. In concept terms figure 4.7 shows the step changes involved.

- First stage: Network presently focuses on centre Kuala Lumpur with operators competing to provide services on the main radial corridors and little service elsewhere, leading to gaps in the system.

- Second stage: In the short term there will be enhancements to the bus system through the provision of BRT, initially on key radial corridors. With the provision of these services, the existing services on that corridor will need to be reviewed and amended to reduce unnecessary competition and support the BRT services. Where there are gaps in the current network for existing development areas, these need to be reviewed and services allocated as appropriate.

- Third stage will be introduction or extension of rail corridors which will require the development of a feeder bus network to link local suburban areas to the rail stations. Associated with this will be a further review of the radial corridors to reduce unnecessary competition between bus and rail. As new developments are completed the bus network will need to be extended to serve these areas.

![Figure 4.7: Conceptual Diagram to Show the Evolution of the Bus Network](image-url)
Chapter 2: Bus Transformation Plan

Only as the result of a detailed review and planning will it be clear what the precise network structure and service levels across Greater Kuala Lumpur/Klang Valley should be. However, it is possible to draw initial conclusions from the current concerns expressed by users, the current understanding of where there is poor network coverage and integration (and in certain markets over-provision), expected growth in demands as Greater Kuala Lumpur Klang Valley development proceeds and the likely impact of the new rail improvements, extensions and new lines.

In relation to the current 2011 network, the overall pattern of changes considered appropriate to improve the contribution of buses is:

- Rationalisation of major corridor services and frequencies, removing excess capacity on many profitable routes and raising route profitability. This may require retaining at least some of the bus hours but using them to improve frequencies at shoulder or lower demand times
- Providing more comprehensive passenger information and signage
- Increase in both number and frequency of feeder routes to the rail network
- Providing reasonable access to land public transport for many people through enhanced local networks and increased frequencies - with local routes often also providing feeder links to the rail network.

The impact of continuing growth in Greater Kuala Lumpur/Klang Valley is likely to be:

- The need for higher frequencies across the network to meet the increasing demands, which will be particularly important as road congestion will limit the realistic ability of the highway network to accommodate growth
- New local services and rail feeders to provide access from new developments both to local centres and the rail network thus increasing the percentage of people within 400m of a service.

However, alongside growth in Greater Kuala Lumpur/Klang Valley the implementation of the rail and BRT elements of the Master Plan will also have very substantial effects on the requirements for bus services. These are likely to involve:

- Reductions in bus provision along the new or enhanced rail (and BRT) corridors as demand moves to using the faster and higher capacity rail network
- Increased need for rail feeders to maximise the benefits of the new rail services by extending their catchment area beyond walking and cycling catchment

Overall, over time, the joint effects of development, economic growth and the rail investments are likely to result in:

- Significant reduction in the need for radial commuter corridor bus capacity
- Substantial expansion of local services to meet increased local demand
- Greater growth in feeder bus services to rail, reflecting wider economic growth and the need to serve the new rail services.

The increase in the number of feeder services will have implications for increasing the bus fleet size. There may be an opportunity to redirect bus resources from radial routes to local and feeder routes. An orderly, planned transition will require the operator and route licensing system to accommodate and facilitate this change and it will be necessary to focus enforcement resources on the locations of greatest change to ensure an orderly transition. It is possible that, depending on the service standard defined for local and feeder services, taken on their own these routes will not be profitable. However any procurement or contracting regime should recognise the role of these routes in achieving wider transport strategy goals and in generating patronage and revenue for the rail based modes. Should a form of contracting or franchising land public transport operations be adopted, then the contract or franchise framework should recognise that some parts of the integrated provision of rail and feeder...
bus services may not, examined as individual components, cover costs. However, the performance of the network should be considered as an integrated whole.

While at this stage of the Master Plan development it is not possible to provide a definitive long term bus network, an indicative network change is shown in Figures 4.8 and Figure 4.9. In 2012 the current network will be enhanced through the introduction of the first BRT services on the Kuala Lumpur- Klang and Kuala Lumpur- Taman Melawati corridors. The network review for 2012 should assess the level of network re-organisation of existing services on these corridors.

In 2013 the second phase of BRT corridors would be introduced with new feeder services associated with the upgrade of the KTM services. By 2014, the two LRT extensions would be complete which will require additional feeder services and restructuring of services on the radial corridors.

Figure 4.8: Conceptual Network Change between 2010 and 2014
Figure 4.9 shows the medium to long term evolution of the network which sees a greater focus on the feeder network to the new MRT services and the completion of the BRT corridors. As the MRT services come on stream there will be further restructuring of the bus services on the rail corridors. Additionally, as new developments are completed there will be a need to serve these by bus in order to encourage modal share by land public transport.

As noted above the key implication for planning a network to respond to these changes is that there will need to be a change in the regulatory regime. Currently there is an ineffective quantity licensing system but international experience suggests that this approach will not allow the bus network to respond to the integration needs unless the regulations change. This issue is discussed in more detail in the next chapter.

**Figure 4.9: Conceptual Network Change between 2014 and 2030**
4.7 Other Initiatives

4.7.1 Improving Reliability - Bus Priority

An important factor in improving the reliability of the bus services in the Greater Kuala Lumpur/Klang Valley region will be a need to protect buses from traffic congestion. Currently buses experience delays due to congestion on a number of radials, particularly into the city centre. There is little provision of bus lanes as shown in Table 4.1 compared to other cities across the world. Kuala Lumpur also has a short network of bus lanes with only 14km in total.

Given the forecast increase in population across the region and the potential rise in congestion, there is a strong case for increased provision of bus priority measures. The BTP recommends investigation and implementation of a number of measures including:

- Bus lanes at key congestion hotspots
- Consideration of corridor based bus priority
- BRT schemes
- Priority measures at traffic signals

A study should be undertaken to assess the current location of congestion hotspots and examine the appropriate treatments to enhance bus service reliability at these locations. In part this might be through providing bus lanes and other forms of bus priority whilst in other locations it might involve better enforcement of measures such as parking control, including the waiting arrangements for buses and coaches that are not taking properly defined operational layover. Ideally the bus priority measures should be provided on a corridor basis so as to provide a fully prioritised corridor but there will be individual locations which are critical to efficient bus operation.

Whilst the strategic focus of investigations should be in those secondary corridors identified earlier, bus priority measures can often be achieved at relatively low cost and can therefore be considered as a short term measure, especially where they produce high returns in terms of benefits to passengers and operators. However that should not preclude a focus on corridors that will have MRT or other enhanced rail at some future point as it may be some years until MRT is fully operational and priority measures can provide significant benefits in the interim period. Moreover it may still be important to provide bus priority measures that ensure the attractive and efficient operation of feeder service for rail based modes.

### Table 4.1: International Examples of Bus Lane Provision

<table>
<thead>
<tr>
<th>City</th>
<th>Population(mill)</th>
<th>Bus Fleet</th>
<th>Population per Bus</th>
<th>Bus Lane (km)</th>
<th>Buses per 1km of Bus Lane</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sydney</td>
<td>4.3</td>
<td>1,900</td>
<td>2,260</td>
<td>90</td>
<td>21</td>
</tr>
<tr>
<td>Santiago</td>
<td>6.5</td>
<td>4,600</td>
<td>1,400</td>
<td>200</td>
<td>23</td>
</tr>
<tr>
<td>London</td>
<td>7.5</td>
<td>6,800</td>
<td>1,100</td>
<td>240</td>
<td>28</td>
</tr>
<tr>
<td>Singapore</td>
<td>4.5</td>
<td>3,775</td>
<td>1,200</td>
<td>155</td>
<td>29</td>
</tr>
<tr>
<td>Seoul</td>
<td>10.0</td>
<td>7,000</td>
<td>1,428</td>
<td>282</td>
<td>32</td>
</tr>
<tr>
<td>Madrid</td>
<td>5.5</td>
<td>2,022</td>
<td>2,720</td>
<td>50</td>
<td>40</td>
</tr>
<tr>
<td>Bogota</td>
<td>6.7</td>
<td>1,080</td>
<td>6,200</td>
<td>84</td>
<td>45</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>6.8</td>
<td>885</td>
<td>1,155</td>
<td>22</td>
<td>267</td>
</tr>
<tr>
<td>Kuala Lumpur</td>
<td>6.7</td>
<td>1,100</td>
<td>6,090</td>
<td>14</td>
<td>78</td>
</tr>
</tbody>
</table>
Chapter 2: Bus Transformation Plan

The implementation of bus lanes, which in effect remove a traffic lane for general traffic, will have an impact on capacity. The impact of this can be reduced by introducing peak time restrictions which will allow buses to utilise these lanes during peak operating hours but will allow general traffic outside of peak times. The peak times can be defined by corridor or standardised throughout Kuala Lumpur. These facilities are commonplace in Europe, working successfully with the appropriate level of enforcement to ensure continuous, uninterrupted passage for buses. Bus lanes have already been implemented in Kuala Lumpur but with limited success. This is due in part to driver behaviour and understanding of the operation of bus lanes and also due to limited enforcement opportunities which are vital to the successful operation of bus lanes on existing highways.

In order to emphasise the nature of particular corridor some cities define ‘red routes’ (also known as ‘greenways’) where there is priority for land public transport movements but also where there is an objective to keep general traffic as free flowing as possible. These corridors are subject to strong enforcement to ensure that the priorities are maintained.

4.7.2 Improving Reliability - Enforcement

As put forward above, the existing bus lanes should be reviewed and enhanced to include new, clear road surfacing, appropriate road markings. The measures should be supported by additional clear signage which informs the drivers that of the restrictions in force.

Where bus priority measures are introduced they should be backed up by an appropriate monitoring regime which might include:

- Police enforcement
- Static camera enforcement
- On-vehicle camera enforcement

In some cities the corridors are branded as designated corridors such as ‘red routes’ or ‘greenways’ with strong enforcement to ensure the success of the priority measures.

4.7.3 Improving Accessibility - The First and Last Mile

Improvements in accessibility are needed to enhance the first and last mile as well as providing ease of access to the buses themselves. The focus should be on ensuring that all stops have good access, including crossing facilities (either at-grade or grade separated) to provide access to both directions of services.

Bus stop infrastructure should be enhanced and improve as outlined later in chapter 4.7.7. This would include the provision of facilities to allow step free access to vehicles. To enable easier access for the disabled, facilities should be provided so that the bus can dock with the kerb and provide a step free access.

4.7.4 Improving Accessibility - Network

Currently 61% of the region’s population live within 400 metres of a bus service. This is measured on the basis of distance from a route rather than from an individual stop. An NKRA target seeks to increase this to 70% with additional bus services introduced by 2012. The Master Plan seeks to target an increased catchment with 80% of the population within 400m of a service. Many of these new services will be feeder services to allow access to local centres and rail services. New development areas should be served by bus but it is suggested that area reviews should be carried out to ensure that bus stops are well spaced and at the local level located so as to capture the largest possible number of walk on passengers. SPAD together with local authorities need to ensure that the design of new developments both allows access and penetration for bus services in terms of highway design and layout and provides operationally attractive connections with the highway network.

A medium term initiative would be to publish general bus related design guidance and standards and, for larger developments, seek to influence the layout on a scheme by scheme basis.
### 4.7.5 Improving The Fleet

International best practice and a commonality of approach from manufacturers have resulted in a comparatively consistent standard worldwide in terms of standardised bus design and layout, although equipment standards can vary significantly from country to country and across operators. As a result of the funding made available to Rapid KL via Prasarana the Rapid Kuala Lumpur fleet is relatively modern and include features such as:

- Low floor single step entrances and exits (where separate)
- Facilities for people with disabilities or impaired mobility to European and Australasian standards including wheelchair and buggy spaces near the entrance, high visibility stanchions and so forth
- Prominent destination displays
- Automatic transmission
- Air conditioning for driver’s cab and the passenger area
- High proportion of standing passenger capacity
- Modern power units that replicate at least the standards set by the European Euro III regulations and equivalent USA and Australasian standards.

Features such as these need to be incorporated into a set of vehicle specification requirements, possibly with a cut-off point in time beyond which all vehicles must comply with the standards in force. Potential transitional measures are discussed in the following chapter but it may be appropriate to make grant aid available on a short term basis to enable operators to upgrade their fleets to the required standards. This could involve early fleet replacement or the upgrade of existing vehicles, for example to replace perimeter seating with conventional forward facing seats.

This would require operators to provide newer vehicles with increased fuel efficiency and enhanced environmental standards, particularly related to emissions. Over time this will lead to significant enhancements in the Kuala Lumpur bus fleet.

The Master Plan recommends that there should be a regular programme of Vehicle Maintenance checks. These would not only assess the vehicles mechanical status but also the performance of the vehicle against a number of quality checks.

### 4.7.6 Driver Training Programmes

Currently drivers are required to meet few standards before they can obtain a driver’s card. In order to obtain a driver’s card, one simply needs a regular driving licence with JPJ, and provided the applicant has five years experiences, they are awarded a driver card upon payment of the fees, currently RM350. Public consultation and feedback has highlighted a number of concerns about drivers including poor driving standards and customer care. In order to improve quality, an enhanced training and testing regime should be implemented in order to improve driver quality standards, and a vocational qualification standard introduced. A driver training scheme which cover the following core areas need to be set up:

- Driving skills including driving for passenger comfort, fuel economy and defensive driving
- Timetable compliance
- Basic numeracy and literacy
- Passenger information
- Health, safety and security
- Broad understanding of the rules and regulations of the industry
- First aid

The recommended approach would be to work with one or more existing training providers to develop an accredited course with suitable content and delivery methods. This would ensure a consistent approach to training. This is the approach adopted in many countries. Once the training scheme has been developed, all new applicants for a driver’s card must be required to successfully complete the training scheme and to undergo a test to ensure they have understood the content of the training. SPAD will input resources to develop the training programme with their chosen local provider.
It may be necessary to provide initial funding for the programme but beyond that the requirement should be met through as commercial arrangement between operators and the training service providers. International experience suggests it would be reasonable to expect new applicants to part contribute to the cost of the training. In order to drive up quality more rapidly the training programme can be rolled out to existing drivers at a later stage but within a reasonable time horizon. The resources required to undertake training with all drivers is likely to be prohibitive therefore the recommendation would be for existing drivers to undertake training if they are reported, receive complaints or are found to have received any law enforcement. The licensing process must be reviewed in order to implement this requirement to attend mandatory training.

4.7.7 Improving Bus Stop Infrastructure

Currently the provision of on street bus stop infrastructure (as opposed to interchanges) is mixed and there is a need for a significant transformation in this regard. The starting point would be to identify appropriate standards for bus stop infrastructure. Three types of facility should be envisaged:

- Type 1- basic stop with information, flag and passenger waiting hard standing;
- Type 2- as Type 1 but with a shelter; and
- Type 3- as Type 2 with the provision of real time information as well as printed information.

Each stop should be given a unique identifying reference that would be used in service licensing, service planning and passenger information. This approach allows a database to be developed for bus stop infrastructure including:

- Location
- Proximity to local attractors
- Type of stop
- Provision of shelter
- Services serving the stop.

This database would help to ensure the stops are well managed and maintained, support improved bus information systems and form the basis of local area reviews, for example of bus stop distribution and catchments.

4.7.8 Information Provision

Currently the provision of bus information is poor compared to almost all developed cities worldwide. The BTP recommends a series of improvements for the Greater Kuala Lumpur/ Klang Valley region:

- Route and service timetable information available for each bus stop - this should identify the first and last bus, the headway and, if appropriate, a detailed timetable. A conventional standard is that a detailed timetable should be provided when a service operates at less than a ten minute headway
- Travel information available as a paper based travel guide and map for the region as a whole
- Provision of all-operator web based and mobile phone based information systems
- Detailed journey planner allowing the user to find a route by land public transport between addresses or stops
- Real time information systems to allow users to assess the arrival time of buses per stop or identify on a plan the location of vehicles on a route.
4.7.9
Fares Integration

The BTP recommends a series of improvements for the Greater Kuala Lumpur/Klang Valley region with regards to fares integration. This is outlined in more detail in the Interchange and Integration Plan. The BTP recommends that:

- There should be a move to an integrated ticketing system with a travel pass that can be used for all modes (such as the Oyster Card (London) or the Octopus Card (Hong Kong))
- Encouragement of cashless ticket systems and a greater proportion of off-bus sales. This will both reduce revenue fraud and leakage and increase operational efficiency through the reduction of dwell times at stops, in turn increasing the attractiveness of the bus network to users.

Key Conclusion

A BTP has been developed, which seeks to deliver an improved network of services; within a regulatory regime which will work for users, operators and public sector entities.

The transformation will deliver the standards that the users currently seek; an open and transparent operating environment for operators, as well as contributing to the objectives and policies developed by the government.

However in order to achieve these standards there will be a need for a change in the regulatory regime away from the historic poorly enforced arrangements.
5 THE TRANSITION OF THE BUS NETWORK
5 THE TRANSITION OF THE BUS NETWORK

5.1 Introduction

This chapter outlines the process of how to move from the ‘existing provision’ of bus services to a ‘future provision’ and how that this can be achieved. The chapter focuses on what are deemed to be the key objectives and policies for moving the region forward, to identifying and highlighting the most effective method of industry regulation for the bus industry locally, as well as a number of additional operational factors which should contribute towards achieving the vision for land public transport for a safe, reliable, efficient, responsive, accessible, planned, integrated, affordable and sustainable land public transport system to enhance socio-economic development and quality of life.

The process of developing the bus network will need to recognize the role of bus services in the integrated hierarchy of land public transport provision in Greater Kuala Lumpur/Klang Valley and address both the way in which bus service provision integrates with rail modes and the process of bus service adaptation to meet the phased introduction of MRT lines and present and enhanced other rail facilities.

5.2 The Need For Change

This document has outlined a number of key concerns relating to the current provision of bus services in the region. The previous chapters highlighted the future role for bus and the expectations placed upon the bus network. In order to achieve this there is a fundamental need to move to a revised structure in the delivery of bus services both on the road and in terms of regulation and procurement as the existing structure fails to enable effective planning to take place. It also requires the delivery of bus services to be properly coordinated in order to achieve the levels of consistency and integration required for bus to take up its rightful role in the wider spectrum of land public transport provision. In order for the change to an improved bus industry to be effective, and to meet the government’s key policies and objectives, it is important that a considered transition process takes place. This transition results in a number of steps that need to take place in order to meet these challenging targets.
5.3 Bus Industry Transition Process

Given the current state of bus service provision in Greater Kuala Lumpur/Klang Valley, it will be impossible to make effective changes in a single exercise. Effective progress towards high quality integrated bus services requires the measured development of technical capacity in the planning and regulatory bodies and in the actual operation of bus services. Thus in order to fully ensure that the industry moves forward and meets its objectives in terms of supporting key policies for the public sector, it is important that a set of stages are considered in delivering the necessary reform required by the travelling public and to meet commercial needs of the operators, and that this ‘staged’ approach is undertaken to deliver a smooth transition process.

Not only has SPAD embarked on a process of technical capacity development there are also very many regulatory, contractual and administrative procedures to establish. The transition process needs to be efficient, convenient, and attractive. These processes need to evolve as the result of a dialogue between SPAD and the providers. For these reasons it would also be inappropriate to introduce processes and measures at a single implementation date, instead there is merit in trialling and refining these processes through local trials, the “quick win” process and the more general staged implementation approach advocated.

The diagram shown in Figure 5.1 identifies a process to move from the existing service provision within the industry to a new model for regulatory regime, one which will assist in developing and allocating risks and responsibilities to key stakeholders, and minimising the risk of service disruptions from outside influences to ensure effective delivery.

Figure 5.1: Bus Industry Transition Process
It is envisaged that the key drivers which are required (principally regulation, network design and planning, enforcement, and performance monitoring) to improve the bus service environment will be delivered as a result of moving through the keys stages (and its iterations) set out above.

5.4 Key Policies And Objectives

Government policy is for the provision of land public transport to be made through improved planning on an integrated basis. Within Chapter 11 of the GTP Roadmap which is entitled “Improving Urban Public Transport”, it advocates full integration of land public transport in terms of inter-modal interchanges, fare systems and the provision of passenger information. It also recognises the need for transport integration to be taken into account when regulating provision, for example through revisions to the licensing of bus services and their subsequent monitoring and enforcement.

The table shown below identifies the six key land public transport objectives which are used as a basis for evaluating strategy and project proposals. These objectives will seek to contribute to economic and sustainable vitality of the region. The third column highlights, what the key priorities are of an effective and efficient bus network that would be necessary to support these objectives in their delivery. It is important to note that these priorities are directly related to key concerns and issues raised through the stakeholder engagement process.

The output associated with the table demonstrate that in order to move the industry forward network design must be coupled with effective integrated network planning and fares structures. The regulatory, and as appropriate, contracting regime must provide a measure of reliability and stability such that all partners can have reasonable certainty in terms of what is expected of them in terms of service delivery.

<table>
<thead>
<tr>
<th>Objectives for land public transport used as basis for evaluating strategy and project proposals</th>
<th>Key Transport Priorities</th>
</tr>
</thead>
</table>
| Increase Economic Competitiveness & Growth | • Access to jobs  
• Access to international links & key employment centres  
• Reduced & reliable journey times  
• Land public transport network capacity |
| Health, Safety & Security | • Personal Security  
• Reduce Road Accidents  
• Encourage healthy lifestyle |
| Improve Land Public Transport Access, Connectivity & Integration | • Network design (particularly where related to economic destinations - Central KL, etc)  
• Network Performance (reliability, etc)  
• Fare (both to fund service & be affordable)  
• Ticketing policy and systems |
| Efficiency & Affordability | • Network design (across KL & including integration)  
• Network Performance  
• “Seamlessness” of interchange  
• Accessibility of key centres |
| Equality of Opportunity | • Design of efficient network  
• “Procurement” driving efficient cost base  
• Performance Management to maximise value  
• For users - fare levels & structure  
• For government - fare levels & network design  
• For operators - ability to predict revenue and cost accurately |
| Environment | • Network design (related to socially necessary services - may be loss making)  
• Network performance - reliability  
• Fares (both to fund services & be affordable)  
• Network design (modal shift reducing car use)  
• Impact on local environment  
• Air Quality  
• Impact on Climate Change  
• Quality Standard (low emissions, driving, etc)  
• Network Design (modal shift reducing car use) |
Most importantly passengers and potential passengers must be able to recognise a stable network of services provision across all modes and be provided with reliable comprehensive passenger information to plan travel and provide assurances during the course of a land public transport journey. Equally operators, notably bus operators, must have certainty as to the role of their services in the wider integrated provision and have confidence that the exacting standards expected of them will be protected by the regulatory, licensing and enforcement process, from the impact of unauthorised competition.

All transport providers will look for certainty in terms of costs and revenues. This will enable them to plan effectively and respond competitively to any invitations to participate in bidding processes. In pricing their proposals all transport operators will benefit from the greater certainty that arises from effective regulation and enforcement and specifically from the assurance that they will be protected from the impacts of unauthorised competitive actions.

By ensuring that these factors are managed effectively, and that appropriate enforcement within the industry takes place, this is likely to also result in and support positive increases in demand and ridership.

In order to deliver the network, a model for moving forward would need to address the regulatory environment, and identifying the most appropriate model for the region and the industry.

5.5 The Regulatory Framework - ‘Mapping The Options’

The diagram shown in Figure 5.2 identifies the models of Regulatory Regime which can be applied to a bus industry environment. Taken as a whole, the diagram encapsulates all of the regulatory, contracting and operating regimes found worldwide. This presents a series of alternative approaches within which each model exhibits varying degrees of public or private sector control, management and intervention, as well as varying degrees of risks and costs associated with operating a bus network and integrating it with the wider hierarchy of land public transport provision in a city or region.

There are four basic models of operation:

- **Open Market** - this is typically a competitive market where operators are free to select their own services and fares. There is little influence by the regulatory body on the network being operated unless it chooses to plan and provide a subsidy for social routes. The variation within this model is the quantity licensing approach as adopted in Greater Kuala Lumpur/Klang Valley at present in which there is a process of route licensing but full procedures are not followed, resulting, in effect, in a free market on the road;

- **Area Service Contracts** - these can be operated as concessions or franchises. In both cases an operator provides a service in an area defined by the public body responsible for network planning. With a concession the operator is free to select the routes and service levels it wants against broad specifications set by the public authority. With a franchise, the public body defines the provision in greater detail including routes, standards and fares. Operators are given an area in which to provide these. In both cases competition takes place off the road to secure a concession or franchise and authorised operations are protected by effective regulation and enforcement;

- **Net or Gross Cost Contracts** - concessions or franchises can operate either as net cost contracts in which the operator assumes the revenue risk or gross cost contracts where the operator simply requires a stated sum for service provision and revenue is vested with the public body. It is also possible to have “hybrid” contracts involving both elements;

- **Public Monopoly** - where the public sector delivers all aspects of the bus service.

An initial interpretation of Figure 5.2 implies that the situations in Greater Kuala Lumpur/Klang Valley and the United Kingdom outside London are very similar. This is by no means the case. In the majority of the UK bus service provision is indeed deregulated in that there is no quantity control. However four important factors distinguish the UK situation from the Malaysian situation:

- Firstly, whilst operators are free to operate the services they wish to on a commercial basis, they are required to notify a government agency well in advance of their intentions, and continue to do this for any changes be the enhancements or retractions, through a registration process
• Secondly the enforcement of standards and regulations is rigorous with effective penalties for non-compliance that can lead to the revocation of operator licenses

• Thirdly there is a mechanism for service levels that fall short of the requirements of the various public bodies with powers to integrate land public transport provision to secure the operation of additional services through a process of competitive tendering

• Fourthly, as the arrangements have matured since their introduction 25 years ago, there have emerged several types of partnership arrangements that enable initiatives to be introduced through the combined efforts of transport authorities and transport providers together with other delivery partners such as local authorities responsible for traffic and travel demand management and the police. Assessed collectively these partnership arrangements have generally been successful in helping deliver stable transport provision and increases in land public transport mode share

The current model of Regulatory Regime in Greater Kuala Lumpur/Klang Valley has been outlined in Section 2 and is considered to be in the area of quantity licensing. However in reality the level of enforcement and monitoring is affected by a lack of precise operational data such that operations are not strictly regulated and operations tend to demonstrate some open market characteristics. However the operations as characterised at present will not provide the level of regulation necessary to achieve effective integration, develop a planned network to respond to the changes outlined in Chapter 4 or to raise standards. Hence there is a need for significant changes to the regulatory and operational regimes,
starting with a quick win – the commencement of a service registration process where operators are required to supply SPAD with precise data on their operations and then update when they introduce new services, modify them or withdraw.

It is widely accepted that, in order to improve the existing situation, a revised regulatory and route licensing model, involving some form of contract (or as a minimum or interim requirement, a partnership or service level agreement) should be introduced. This would enable SPAD to exercise greater public sector control over the industry and introduce better governance processes at least in the short to medium term (perhaps the next five years) whilst planning and regulatory processes and capacity develop. The models which are likely to be able to support this change are towards the right hand side of the structure diagram (Public Monopoly; Gross Cost and Net Cost Contracting).

In order to exact change on the industry whilst ensuring that effective competition that is in the public interest takes place it is recommended that a contracting regime should be implemented as the basis of the relationship between SPAD and the bus industry. This may take a variety of detailed forms but in essence a contracting regime is one which sees the public sector plan the network to its exacting requirements. However, service delivery is secured through the privatisation, or outsourcing, of the operations (or supply) side of the network. It does afford the wider public sector the ability to:

- **Define the network** - this enables the state to design the bus network to exacting specifications, outlining service standards; vehicle specifications; bus frequencies and headways

- **Set fares and ticketing structure** - fare levels should be set at an appropriate level for the public to afford; but at levels which generate revenues that enable the operators to reinvest within their organisations and meet the service level standards required as part of the contractual arrangements. Fare levels should be reviewed on a regular basis, such as annually to account for any changes within the economic environment and to account for factors such as fuel prices that may unduly impact on operating costs

- **Tender services or corridors or clusters of services** on a competitive basis but, significantly, with the competition taking place off the road in order to secure some form of exclusive contract, rather than on the road between operators whether they are operating legitimately or in breach of licensing regulations

This form of contracting can see the public sector taking the financial risk and simply requiring the operator to provide a cost for running services, or passing the risk to operators or in some way sharing it. In the Kuala Lumpur situation it would be appropriate for the public sector to bear the revenue risk, at least for an initial period of say five years. Thus all revenues would be banked with the public body (in a developed system much off-bus revenue is gathered in any case through public sector outlets, agents such as retail shops, and other non-operator outlets) and the operators receive a predicted sum for provision that can include a reasonable (sometimes capped) profit margin. In this model the public sector retains the surpluses on well used services and can use them to support socially necessary or otherwise loss making though valuable services (such as peak operations like BET).

Once stabilised it may be possible to move to a contracting regime in which the operators assume more risk, or introduced further incentives in the form of bonus payments (or some revenue retention) where operators exceed quality standards or patronage targets. Incentives or bonuses flow in these situations as a result of the efforts of the operators in services delivery, rather than from public agency factors such as a tighter travel demand management regime.

It should be emphasised though that the day to day operational aspects of the bus services would be provided by the private sector contract secured through a competitive tendering process. Its performance would however be monitored closely within a defined performance management regime set by the public sector. It would be reasonable for the contracted operator to expect to be protected from unauthorised competition from other bus operators through an effective and
thorough monitoring and enforcement regime that checks on not only the performance of contracted operators in relation to what is required contractually but also on the wider operation of bus services.

Thus a detailed operating specification will enable the public sector to effectively monitor the industry to ensure that standards are met in accordance with the contract. It is possible to introduce a ‘fine’ system, often based on an accumulating tariff or ‘points’ basis, which can be levied for departures from specification such as missed journeys or poor levels of punctuality or performance. Ultimately persistent poor performance would be penalised by loss of contracts or a reduction in the scale of a contract.

This model has the benefit that the private operator will remove any unnecessary costs from the operational delivery side, with the competitive tendering process ensuring that costs are managed and services provided consistently.

Since the need for integrated planning and coordination and to raise quality standards applies across the entire network it is proposed that the competitive tendering regime applies across the network and that it is rolled out on a route group or corridor basis and is so structured as to permit intermediate changes in arrangements, for example to meet the opening of a new area of development or, as will be the case in Greater Kuala Lumpur/Klang Valley, to provide feeder routes as the proposed rail based initiatives are introduced on a staged basis.

Any model that involved a lesser degree of service specification and a greater degree of operator freedom (or indeed a public sector monopoly type of operation) is likely, at least in the short to medium term, to perform less well in the Kuala Lumpur situation and would not meet the needs and expectations of the:

- **Public Sector** - in achieving its policies and objectives, as discussed in Table 5.1
- **Bus Users** - in ensuring a reliable; punctual; safe and integrated network of services
- **Bus Operators** - in enabling them to be more competitive and supportive in the growth of the industry

Competitive tendering can be applied equally to any conventional bus service or cluster of services as it can to BRT services; where in the initial stages of such schemes, the public sector can plan and define exactly how they would envisage such services would operate and how they would integrate with the wider bus network and indeed the integrated land public transport network.

Thus in the Greater Kuala Lumpur/Klang Valley environment competitive tendering would be applied to provide all services including:

- Those that have a primary role in supporting integrated networks including rail feeders and complementary services
- Profitable bus corridors to raise quality and manage wasteful and “duplicative” competition - both between bus services and with parallel rail services
- Areas which see a large percentage of socially necessary services at the “fringes” of the urban area or at times of lower demand
- Where the public sector seeks to develop new services in existing areas currently with no service or areas of new development, thus encouraging modal shift to land public transport from private car or motorcycle use
- Other public sector initiatives for example park and ride services and peak BET services
- Support marginal services.

The contracting regime can be implemented either on a corridor (or route) basis or on an area wide basis. Whilst both have their individual positives and negatives, it is envisaged that a mixture of the two could be implemented with emphasis placed on where the need for service improvement is greater. Area-wide tendering enables the authority to secure a single operator to provide the integrated local network, minimising potential inter-operator conflicts. It can facilitate ‘packaging’ of profitable and unprofitable routes to create a balanced portfolio of routes with operators. Given the role of bus in the wider Greater Kuala Lumpur/Klang Valley land public transport hierarchy it may also be appropriate to link bus service packages with the provision of rail services, making an individual operator responsible for delivery both of rail services and the supporting feeder buses.
Regardless of the choice of gross or net cost tendering, it is paramount that the ‘planning’ element of the network is still managed to some degree by the public sector.

A Gross Cost Contracting regime minimises the barriers for operators to tender for services. Since the operator bears no revenue risk their primary concern is the ability to operate the services specified reliably and to the specified standards. The public authority benefits from this increased participation in the market to supply services and the lower net costs that will result, but this is at the cost of taking on all revenue risks and a requirement for stringent monitoring of not just service delivery but also revenue collection and accounting. Nonetheless in the early stages of moving to a tendered network Gross Cost Contracting has been shown to foster active operator participation and given the present structure of the industry in Kuala Lumpur appears to be the most appropriate way forward at least in the short and medium term.

A further advantage is that, whether or not it is decided to package together the provision of rail and bus services, in a period of rapid change in the mode of delivery of land public transport improvements, a gross cost arrangement minimises the revenue uncertainties faced by operators and enables them to focus efforts on service delivery.

The Net Cost Contracting Regime gives some increased commercial freedom to the private sector, and thus builds on operating efficiencies and service incentives whilst still operating within a service contracting regime. Whilst the network and fares are still centrally planned, the net cost model sees the operator bid to operate the service by specifying how much subsidy they require to fill the gap between fares revenue and operating costs. Indeed it is not unknown for an operator to propose to make payments to the sponsoring public body if profit levels are predicted to be sufficient - depending on a nation’s corporate tax regime it may be in the interest of an operator to propose this anyway.

Thus the principal benefit of Net Cost Contracting is that the revenue risk lies with the operator and there is therefore an increased incentive to promote the service, to operate the services well and to collect all revenues in order to keep revenue levels as high as possible. The key disadvantage is that operators are unlikely to bid for services unless they have a reliable indication of potential patronage or revenue. The situation in the Greater Kuala Lumpur/Klang Valley means that such information is not currently available. In the Greater Kuala Lumpur/Klang Valley situation, it is suggested that operators will not have sufficient experience of local network or corridor operations in the early years of the regime change to be able to assess revenues accurately and thus price contracts reliably. Moreover unless a strong wider enforcement regime offers appropriate revenue protection to contracted operators, they would be encouraged to factor in a higher level of revenue risk to their bids.

The lack of reliable base information on revenues and demand and, indeed, the major but inevitably uncertain changes that are likely to result from the envisaged network changes and introduction of new rail services means that Gross Cost Contracting may be the appropriate way forward at this stage. Gross Cost Contracting is much better suited to the fluid situation in the Greater Kuala Lumpur/Klang Valley where network flexibility is essential as both the bus and rail networks develop, and to a staged approach in which, inevitably, there will be short term overlaps between services operating in accordance with the new regime and those yet to fall within the new arrangements.

Without the added complication of operators having vested interests in maintaining high revenues on their own routes it is much easier to refine, adapt and develop the network to respond to changes in demand or other services. This model is currently operated in a number of locations around the world, with considerable success. The most obvious example of this provision is that currently operated is the provision of London bus services. These arrangements have been in place for over 20 years and whilst gross cost contracting remains as the basis for provision a number of incentive arrangements have been introduced to encourage operators to provide increasingly high standards of service. It should be noted however that
there is a considerable cost to the public purse in the case of London provision. This however should not be seen as a criticism of London or indeed as a drawback – it is simply that London, like many other major cities worldwide, has taken a strategic view that investment in a certain level of land public transport provision delivers much wider social and economic benefits.

A Gross Cost Contracting regime can be implemented for a relatively short period of time, in geographic tranches, for example a five year period. This will enable the public sector to generate a deeper understanding of the operations of the bus and wider land public transport industry through improved reporting, data collection, monitoring and enforcement. It is also an appropriate regime for Greater Kuala Lumpur/Klang Valley where the bus network will, in line with the staged introduction of the MRT network and other rail based initiatives, be required to adapt to changes which see some services feed rail interchange stations rather than operate the full length of a corridor.

Once the public sector has a greater understanding of the industry, has planned and defined the operating standards, and specified how the network should look for a given period of time, the revised processes will have become embedded. It would be realistic at that time for the network, or parts of it, to move to a Net Cost Contracting regime for buses or for the area or sub-area provision of both bus and rail based modes of the planned land public transport network.

One other major advantage of a gross cost contracting regime is that the public sector agency will hold detailed route and service information. This will enable it to discharge a passenger information responsibility through conventional and electronic means. Comprehensive and up to date passenger information as exemplified by the provision in major conurbations such as Hong Kong or London, but is almost totally absent in Greater Kuala Lumpur/Klang Valley and is a major deficiency of the current arrangements.

5.6 BUS INDUSTRY RISK PROFILES

It is important in determining the regulatory model that the wider risk profiles of the options is considered in order to determine whether these risks could influence or indeed prevent moving to a preferred model.

A regulatory regime which sees greater control exerted by the public sector brings wider benefits associated with: supporting governmental policies and objectives; meeting service standards; and increasing public satisfaction with bus services. However, it also brings associated risks.

An initial risk matrix has been used to guide development of this plan, but a fully defined risk matrix should be developed which considers what the risks are and where they should lie (in terms of organisations). A review of the model options shown in Figure 4.2 would then need to be take place.

One of the key risks associated with a regime which sees more influence by the public sector, is that of cost. The Gross cost contracting regime is one which will enable the public sector to fully plan and define the network, but one which will bear an increased level of funding risk since any errors in forecasting revenue create risks to the public sector’s cash flow. This area of financial risk flows not only from the fact that the public sector would bear the revenue risk of the operation but also from the fact that poor licensing enforcement - a matter largely under the direct control of the public sector - could further undermine revenue. Conversely, in accepting those risks the public sector gains greater certainty, more flexibility and ultimately more competitive pricing of tenders by operators.

Thus a more centralised and rigorous method of bus service regulation is deemed necessary to achieve improvements within the industry. In order to develop real change it is fundamental that the model - in the short to medium term - includes greater state intervention and direct funding.
5.7
RapidKL And Prasarana

In order to properly consider the future for bus service provision in the region, it will be important to reflect upon the role of the Prasarana and Rapid Kuala Lumpur within the industry, and in order to support the proposed regulatory model, consider changing processes relating to the delivery of services by the organisation.

Previously outlined within Section 2.4, Prasarana is a 100% government owned company that was set up to own the assets of land public transport services in Kuala Lumpur. It was established in 1998 to assist in reforming the rail and bus industries in the Greater Kuala Lumpur/Klang Valley region, and took over bus services provision in 2004, thus establishing the RapidKL bus services division. Over the course of the past seven years, RapidKL has continued to operate bus services within the region, competing on many services with private commercial operators.

The current role sees Prasarana managing the assets used by RapidKL and then RapidKL operating the bus services with access to Prasarana assets and financial support.

This intervention within the industry has caused concern by the commercial operators who consider that it creates an unfair competitive market. However the arrangements are founded in the recent history of the performance of both rails based and bus modes in Greater Kuala Lumpur/Klang Valley and can be considered a necessary and measured response to the crises that beset land public transport in the late 1990s and the first few years of this century.

Whilst a regime change from the current arrangements to an initial Gross Cost Contracting regime would still enable involvement from both Prasarana and Rapid Kuala Lumpur, the relationship between the two organisations would require change in order to ensure transparency in service delivery together with processes to ensure Rapid Kuala Lumpur competed on fair terms with private operators.

It is suggested that going forward that the service delivery side, currently provided by Rapid Kuala Lumpur could be devolved from Prasarana, and that the two organisations could operate separately. Infrastructure assets owned by Prasarana such as interchanges and bus garages could be made available to operators who secured contracts - if appropriate on a shared basis with two or more operators. These operators could pay pre-determined charges to Prasarana or simply be granted equal status access according to management and capacity regulations that related to the planned rail and particularly bus network and to a properly assessed measure of the capacity of facilities.

The role of Prasarana could therefore be to plan, monitor and enforce the future delivery of the entire network, along with other public sector entities such as local authorities. If this approach were adopted, they would move, in relation to bus services, to an independent, impartial role between public and private provision of bus services.

Rapid Kuala Lumpur would operate as a standalone bus operator, providing services to the public sector through the contracting regime in line with the existing commercial providers. This would require that Rapid Kuala Lumpur accounted for the costs of all its operations and assets. It would also require that there was a transparency over the provision of any operating losses and in due course subsidy should only be available on the basis of success in tendering for routes requiring subsidy. To ensure that there was no internal cross-subsidy, clear and fair processes for pricing of tenders would need to be introduced. These would be major changes to the practices and basis for RapidKL’s operations. Recognising this, it is likely that there would need to be a phased move to this semi-commercial status and enable improved efficiency in the organisation.

Setting aside issues of management, funding and ownership it should be recognised that the brand “Rapid Kuala Lumpur” has started the process of presenting the land public transport network as more
cohesive. Whether or not there is a change to the status or role of Prasarana or Rapid Kuala Lumpur there appears to be a case for retaining and developing the brand “Rapid Kuala Lumpur” as the network for land public transport in Greater Kuala Lumpur/Klang Valley. This need not mean that the brand remains “owned” by Prasarana. Instead operators may compete for contracts to provide planned services under the RapidKL network identity. This model is commonplace throughout the world, for example in London and many other European cities and regions, as well as in the less regulated areas of the UK outside London.

5.8 Transition

In identifying that the most appropriate model going forward within the short to medium term is that of Gross Cost Contracting regime, it is important to consider how it is achieved.

Initially, the Government will need to ensure that they have the correct mechanisms in place to deliver such a regime, and that the law enables such a model to prosper. These mechanisms therefore centre upon on a number of factors such as:

- Legal ability to implement such a model;
- Ability to manage the process of implementing the regime;
- Knowledge and staff technical capability to define the network as per the government’s requirements - as noted above, this could usefully draw upon Prasarana’s existing expertise;
- Ability to deal with the giving and receiving of operator payments and ‘fines’

It is also important that the government is fundamentally aware that such a regime is likely to involve financial intervention at least in the early period to ensure that services are provided as per their exacting requirements.

In terms of the operational aspects for delivery, the network would then be tendered by the public sector. The public sector would, through an open and transparent tendering process, stipulate:

- Full services specifications (including timetabling, headways & frequencies, routings, integration with other services, service numbers, origins, intermediate points and destinations, etc)
- Full Service standards (including what is required in terms of publicity and information, vehicle types and qualities, driver standards, etc)
- Fares (including levels, integrated ticketing, smartcard ticketing, etc)

The Gross Cost Model, in essence, affords the government and the wider public sector the ability to stipulate how they would like the entire network to operate. The contract would be expected to build in ‘incentives’ to encourage and reward good performance and fines to penalise poor performance.

Owing to the significant ‘knowledge gaps’ on how the bus network works or performs, part of the initial phases would be to generate data to support more robust procedures and potential alternative future regimes such as Net Cost Contracting.

In order to generate this data, it is important to ensure than an effective Performance Monitoring Regime (PMR) is implemented to ensure that data flows freely between the public and private sector. A PMR would ensure that the operator returns full and complete data - specified by the public sector - on a frequent basis. Many contracting arrangements require a daily report to be submitted, including a ‘nil defects’ report for those days when the entire service operated to specification.

This information requirement will enable the public sector to develop Key Performance Indicators (KPIs) for the provision of services and for these KPIs to be monitored effectively. This will both create the level of understanding to manage and raise operator performance and to establish a more robust basis for future tendering.

Whilst the existing regulatory regime within the industry is undertaken to some degree by SPAD, through revised licensing arrangement it is generally agreed that the regulatory process needs reform and that the transition to the revised process would need to be considered.
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Setting Rapid Kuala Lumpur to one side, the public sector currently does not stipulate routes; timetables or other element of bus services provision, but it does manage the licensing process for routes, and it does set and enforces fares for all passengers.

In order to consider the transition from the existing regime to a new model, it is acknowledged that the public sector should:

- Determine the short and long term objectives for the performance of the above
- Develop the necessary strategy and policies to achieve these objectives
- Plan, provide, secure or promote the provision of a properly integrated, safe, economical and efficient transport system by road
- Supervise the testing, registration and licensing of motor vehicles and drivers
- Supervise the regulation, management, safety and control of road traffic and the transport of passengers and goods
- Promote training and the welfare of those involved in providing land public transport services

In ensuring that these services are delivered a transition process needs to be established and implemented setting out the government’s desires for the land public transport network in terms of its day-to-day operation, the controls over competition and the mechanisms through which the network can be altered and adapted to changing travel demands and a clear process and timetable for moving from the existing licensing regime to a Gross Cost Contract Regime. This will take a number of years recognising the need to re-plan the entire network, the need to progress with tendering at a pace that operators can respond to effectively and simply the time taken to invite, assess and award contracts. Additionally it is not yet known precisely when new rail initiatives will come on stream and it will be necessary to match bus network changes with the introduction of new rail services.

It is this transitional process that needs to be adopted before any radical improvements can be made to the network, so that all parties are clear as to the purpose of change, the process and timescale within which it is going to be implemented and commitment from all to support the transitional arrangements.

The provision of a well-planned, integrated bus network forms a central focus within an overall Integrated Transport Strategy, especially where the bus operators are provided with contractual incentives to improve the quality of the service and to maintain the inherent flexibility of road-based land public transport. However, it is important to recognise that on its own, a reform of the bus industry is unlikely to deliver the necessary transformation of bus land public transport.

As has been found in many situations elsewhere, it is often the implementation of a whole-scale package of transport-related measures as discussed in Chapter 4 that produces modal shift, rather than simply the provision of an improved network. It is with the Master Plan and the associated plans that the improvements that are needed within the land public transport industry can be achieved. Critical to delivery of these changes, however, is the specification of standards and, as appropriate, their inclusion in route and area contracts.

Key Conclusion

A BTP has been developed, which seeks to deliver an improved network of services; within a regulatory regime which will work for users, operators and public sector entities.

A comprehensive tendering regime based on contracts will secure the services necessary to meet the Plan’s objectives and raise standards.

Prasarana and Rapid Kuala Lumpur will be transformed to support the improvements planned.

The transformation will deliver the standards that the users currently seek; an open and transparent operating environment for operators, as well as contributing to the objectives and policies developed by the government.
6 PHASING AND DELIVERY

6.1 Introduction

This chapter provides guidance on the process of delivering change to land public transport regulation, enforcement and service levels in the Greater Kuala Lumpur/Klang Valley region. It recognises three key influences that will have an impact on the pace of change:

- Development of technical and administrative capacity in SPAD
- Ability of operators to acknowledge and respond to the new arrangements and opportunities
- Requirement to introduce certain changes in response to the staged introduction of the primary rail based mode improvements.

The BTP is one in a series of subsidiary plans which have been developed to support the improvements necessary to land public transport within Greater Kuala Lumpur Klang Valley. Other elements of the Master Plan are reported in the remaining Subsidiary Plans, and include:

- Urban Rail Development Plan
- Taxi Transformation Plan
- Interchange and Integration Plan
- Land Use Plan
- Travel Demand Management Plan

In addition to these documents, a series of quick win proposals have been identified. A number of these quick win proposals centre upon improving the ‘softer measures’ associated with land public transport, and as such as relatively easily implementable. Equally a number of these are directly relevant to bus service provision, either as local stage bus services or as BRT, and include:

- Improvements to paper-based land public transport information
- Improvements to roadside infrastructure (bus stop poles, flags and timetable cases)
- Improved levels of enforcement
- Education and Training
- Introduction of bus lanes and bus priority measures

These subsidiary plans, together with additional supporting quick wins proposals will assist in providing an integrated land public transport plan for the Greater Kuala Lumpur/Klang Valley region and are summarised in the overall Master Plan document. The plan will also identify the role of each of these subsidiary plan measures in terms of proposed modal share targets which will be contained within the Master Plan.
6.1.1
New License Issue

Section 2.17 outlined the re-licensing process being adopted by SPAD. This will require a two level licensing process for operators to provide local stage services. The first stage is in effect an operator licence. Operators will need to have this license before they can apply for route licenses in order to provide bus services on the road. These revised licensing requirements will eventually require a range of key requirements to be met by operators, including:

- Route details to be published
- Provision of service delivery performance data to SPAD
- Provision of bus tracking units for all vehicles in order to facilitate monitoring. These units may be coupled with the provision of real time information and be incorporated in ticket machine modules. A precise specification and standard requires further review
- Penalties for non-performance need to be part of licenses and, as appropriate, any contracting regime
- Vehicle standards to introduce at least bi-annual testing
- Provision for termination of permits if major change in network
- Integrated Ticketing

This regime needs to be supported by a detailed database of routes which can be used as the basis for network revisions, as part of the performance monitoring regime and to form the backbone of comprehensive and accurate passenger information. For the database to be of value in network planning and other initiatives, however, there needs to be a process of updating operational details that follows and backs up the issue of a route license. This is referred to as a registration system and comprises an initial approved application in detail for a route license and a series of subsequent actions that keep the route license fully up to date. This process for services going forward would need to be in reasonable detail. Table 6.1 illustrates the minimum base data that is needed and is very similar to the information presently required, but seldom supplied, for a route licence application. Operators would need a reasonable amount of time to become familiar with the requirements and meet them.

As noted above there is very little information on bus service levels available at present. It is considered essential that the registration process is introduced as quickly as possible.

It is known that at present the operators have not deposited particulars of the services they provide and that, in the majority of cases, detailed service data was not provided with the route licence applications and that the authorities, have not been updated on service changes. In the first stage of implementation of the new arrangements SPAD would, in effect, be facilitating a bus services “amnesty” in that operators would be required to legitimise what they are delivering at present. So extensive is the degree of non-compliance with route licensing requirements that there appears to be no other reasonable option to kick off the process of network planning. Once registered with SPAD then service details would be required to be updated in advance of any changes.

Ultimately the registration process would be on an electronic database with operators making updates electronically. However it is suggested that a hard copy system is introduced initially and that this is done for a trial area of the conurbation.

This would allow for adjustments to be made to forms and procedures in consultation with operators before the system is rolled out to the whole of Greater Kuala Lumpur/ Klang Valley or indeed nationwide.

It would also facilitate the introduction of a quick win - the introduction of a passenger information trial for the area or part of the area covered by the initial registration trial.
Chapter 2: Bus Transformation Plan

6.1.2 Developing The Basis For Decision Making

It is likely that the present bus service pattern represents a reasonable approximation of demand on key corridors at key times because it is based largely on a relatively unregulated interpretation of demand by operators. However the process of bus network planning cannot be started before the registration process outlined above is up and running and a full assessment of provision is made.

The licensing and registration process should eventually generate knowledge of the network and its performance in terms of ridership, costs and revenues. However at present the best estimates of demand flow from the modelling exercise carried out to determine the likely levels of demand for key movements in the conurbation - the exercise that has informed the decisions about the appropriate land public transport modes for individual corridors of movement, including the recommendations about rail based provision. Ultimately it is critical to gather network performance data from all operators as a basis for decision making on the scale and density of the bus network as well as for service specification and capacity decisions on other modes. However this process is a long way from being operational. This early phase should seek to reach a consensus on the scale of data required in the future and again trial a process with operator partners.

The type of data required of operators should include, initially, passenger and trip data on a route by route basis for different times of the day. Operators may at present regard the supply of information as commercially sensitive and be reluctant to provide it or to incur the cost of gathering and processing it. However once a system of operating contacts is established, a requirement to make information available can be incorporated in the conditions of contract, together with rights of survey and audit.

### Table 6.1: Service Registration Data Requirements

- Operator details - name, address, operator licence number;
- Route licence number attributable to the service provided;
- Start and finish points of the service - in detail, not simply say Puchong - KLCC;
- Main intermediate points served;
- Route number or name;
- Type of service (for example full stopping, limited stop, BRT, BET);
- Days of operation and spread (first and last buses);
- Frequency (for example every 20 minutes 0600-0730, every 10 minutes 0731-0930, every 20 minutes 0931-1530 and so forth);
- Stops, including interchanges, to be served on the route - all recognised stops, selected stops, hail and ride over some sections);
- Full description of the roads to be used including details of roads used in any one-way systems. It will be particularly important to give accurate route details at each end of the route, for example in centre KL;
- Map of the route in sufficient detail to identify accurately the roads used. Note that it may be necessary and productive to supply the operators with copies of base mapping to ensure consistency of approach;
- Full timetable showing individual departures, shorts and so forth. Operators do not at present use intermediate timing points and do not publish detailed timetables, believing that operating conditions in Greater Kuala Lumpur / Klang Valley are so unpredictable as to make such detail of little value. This may have to be accepted but operators, initially, should be required to state all departure and arrival times, or departure and running times.
6.1.3
Network Development

Once a complete picture of current bus provision and updates to this are flowing from the operators in the form of regular registration documents, the process of network revisions and network planning can start. As noted earlier the current provision, provided by the bus operators on a largely commercial basis, forms the basis of the present network. It will be necessary to devise some guiding principles relating to the level of service provision to be made.

This process has already started with the identification of the ‘white areas’, those areas of Greater Kuala Lumpur/Klang Valley beyond a defined distance of a land public transport service. Clearly it will be impossible and ineffective to spread technical and financial resources thinly in order to attempt to address large numbers of these areas very quickly. Thus it will be necessary to prioritise these areas for attention through a further assessment that could be based on factors such as:

- Land use type of the areas
- Population density and distribution in these areas
- Likelihood of people in these areas making use of a bus service
- Ease of connecting these areas to a corridor bus, BET, BRT or rail based mode

It will also be necessary to devise set of target service level standards. There is little merit in imposing standards that cannot be achieved initially so they are likely to be quite rudimentary initially, but become more refined and tightened up as the operators become more accustomed to the new service specification, regulatory, enforcement and, eventually, contracting arrangements. An initial set of standards could relate to:

- Service frequency
- Service spread (first and last buses)
- Availability of published timetable
- Connectivity and interchange standards (for example the need to make a bus-to-bus connection where practicable)

A further consideration is the actual cost of provision of new services in these white areas or indeed anywhere else on the Greater Kuala Lumpur/Klang Valley bus network. It is understood that whilst targeted financial support may be made available to kick-start certain types of bus project, there appears to be a general presumption that direct financial support for operating deficits is not generally to be made available. It is also worth noting that there appears to be a significant level of wasteful duplication in the network as operators “chase” revenue on the most lucrative corridors and at the times of day of highest demand. Such wasteful duplication, or “duplicative competition” can eventually be reduce or eliminated through changes to the licensing process, more targeted enforcement and, eventually, through a process of contracting of bus operations through an off the road competition, as outlined earlier.

In addition to the more general process of introducing a bus network plan it will be necessary to start the process of introducing feeder services to key bus, BET, BRT and rail mode corridors.

6.1.4
Trial Projects

An appropriate way forward would be to test a series of procedures through a number of local projects carried out by SPAD with the partnership and co-operation of the operators and local authorities. These trials could also start the roll-out of the contracting model although it would not be possible to replicate the full context of a contracting model that sees a degree of exclusivity on an area or corridor basis and a level of enforcement that both ensures contracted standards are maintained and unauthorised competition is prevented. As put forward earlier this approach would allow both SPAD and operators to understand the requirements and for adjustments to the process to be made. The selection of trial projects could embrace the following scenarios:
Chapter 2: Bus Transformation Plan

- Small town local network with feeders (potentially Klang or Shah Alam)
- Development of a feeder network in a “white area” such as the Mont Kiara/ Hartamas areas
- Development of a feeder network to a rail based interchange
- Tendering contract process to be trialled, possibly on a shadow basis initially
- Locally improved passenger information
- Test SPAD’s revised and additional monitoring and enforcement processes
- Allow decisions on the contracting model to be adopted

6.1.5 Full Transition

Final stage would be to roll out new regulatory regime. This is likely to be a phased approach which will require co-ordination with the network restructuring to account for changes in the network brought about by new rail services and new developments. A five year programme may be appropriate with 20% of routes tendered for contract each year. The whole process would be supported.

Figure 6.1: Regulatory Timeline
### 6.2 Phasing - Developing The Network

Figure 6.2 shows the timeline for the Bus Network development and how this links with the NKRA initiatives. The figure shows the roll out of bus priority measures by the enforcement of existing corridors and the roll out to new corridors by defining red routes. Network planning is an on-going process which over time needs to reflect the changes resulting from new services such as BRT, the rail extensions and new MRT lines and the need to cater for new developments. At the same time the network planning needs to reorganise routes on those corridors where there is excess competition and increase the accessibility to the network such that 80% of the population are within 400m of a bus service.

Re-specification of the route permits will allow the regulators to be more specific about the type of vehicles being used on the network. The standard of the vehicle fleet will be enhanced through this process. Other on-going initiatives will include the roll out of an integrated ticketing system as well as improvements to bus stop infrastructure and information systems.

### 6.3 Next Steps

The next steps to improve the provision of bus services centre upon:

- Implementation of the bus service registration procedures to support the operator and route licensing regime
- Improvements to the bus licensing regime
- A series of trials to develop technical capacity and procedures
- Implementation of a revised regulatory regime with stakeholders having the appropriate powers to deliver a contracting regime, on a gross cost basis at least for an initial period
- Phased full review of bus service provision to provide an integrated network complementing rail services and to package the network for tendering - conclusions of the BRT study will also influence this planning and tendering;
- Development of an appropriate PMR and development of a series of KPIs to monitor service performance and contract compliance.

![Figure 6.2: Bus Network Timeline](image)
Chapter 2: Bus Transformation Plan

Objectives

Economic Competitiveness
- Access to Job
  - The increased land public transport provision will significantly enhance accessibility for workers to reach jobs with improved bus services also improving access to rail services.
- Access to International Links
  - Improved bus links will be provided across the region and to Kuala Lumpur Sentral to Facilitate international access to KLIA and regional transport hubs.
- Reduce Journey Times
  - Increased land public transport will reduce the journey time & encourage modal transfer which will reduce congestion for private & commercial vehicles.
- Increase Reliability
  - Reduced congestion for private & commercial vehicles will aid reliability. Bus reliability improved through improved supply & measures to improve system reliability.

Safety & Security
- Providing improved safety & security through quality public transport
  - Bus quality standards will consider safety & security and take into account the needs of all users.
- Reduce road accidents through model transfer
  - The encouragement of modal transfer will reduce the vehicle kilometres travelled in the region thus reducing accidents.

Access, Connectivity & Integration
- Improve accessibility
  - Increased bus service will close the transit gaps allowing more people access to the system and via interchange to the improved rail network.
- Improved integration between modes
  - Interchanges between bus services & other modes will reduce the “barriers” of making a land public transport journey. This will be enhanced by integrated and off bus ticketing.
- Improved integration between Transport & Land Use Planning
  - The Master Plan seeks to ensure the local bus network to address local authority plans and complements future land use plans.

Efficiency
- Journey Time Reliability
  - Improvements such as BRT and bus priority measures will assist the provision of a reliable service.
- Land public transport mode share
  - The provision of the bus improvements and new capacity will increase land public transport mode share.
- Deliverability
  - A deliverable plan will be established through detailed technical feasibility.

Social Inclusion
- Providing access for all through better connectivity
  - Increased bus services supply will close the transit gaps allowing more people access to the system.

Environment
- Improve air quality through modal transfer
  - Modal transfer will reduce private vehicle kilometres and congestion thus improving air quality.

Key Conclusion

A phasing strategy has been derived which best serves the needs of the region.
It also indicates one which is sustainable for the future delivery of bus services.
The first and last miles of a land public transport journey are crucial.
Measures must be introduced to maximise the benefits of bus services by providing customers with integrated journeys that reduce the barriers of using land public transport.

Table 6.2: Summary of Benefits

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Indicator</th>
<th>Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economic Competitiveness</td>
<td>Access to Job</td>
<td>The increased land public transport provision will significantly enhance accessibility for workers to reach jobs with improved bus services also improving access to rail services.</td>
</tr>
<tr>
<td></td>
<td>Access to International Links</td>
<td>Improved bus links will be provided across the region and to Kuala Lumpur Sentral to Facilitate international access to KLIA and regional transport hubs.</td>
</tr>
<tr>
<td></td>
<td>Reduce Journey Times</td>
<td>Increased land public transport will reduce the journey time &amp; encourage modal transfer which will reduce congestion for private &amp; commercial vehicles.</td>
</tr>
<tr>
<td></td>
<td>Increase Reliability</td>
<td>Reduced congestion for private &amp; commercial vehicles will aid reliability. Bus reliability improved through improved supply &amp; measures to improve system reliability.</td>
</tr>
<tr>
<td>Safety &amp; Security</td>
<td>Providing improved safety &amp; security through quality public transport</td>
<td>Bus quality standards will consider safety &amp; security and take into account the needs of all users.</td>
</tr>
<tr>
<td></td>
<td>Reduce road accidents through model transfer</td>
<td>The encouragement of modal transfer will reduce the vehicle kilometres travelled in the region thus reducing accidents.</td>
</tr>
<tr>
<td>Access, Connectivity &amp; Integration</td>
<td>Improve accessibility</td>
<td>Increased bus service will close the transit gaps allowing more people access to the system and via interchange to the improved rail network.</td>
</tr>
<tr>
<td></td>
<td>Improved integration between modes</td>
<td>Interchanges between bus services &amp; other modes will reduce the “barriers” of making a land public transport journey. This will be enhanced by integrated and off bus ticketing.</td>
</tr>
<tr>
<td></td>
<td>Improved integration between Transport &amp; Land Use Planning</td>
<td>The Master Plan seeks to ensure the local bus network to address local authority plans and complements future land use plans.</td>
</tr>
<tr>
<td>Efficiency</td>
<td>Journey Time Reliability</td>
<td>Improvements such as BRT and bus priority measures will assist the provision of a reliable service.</td>
</tr>
<tr>
<td></td>
<td>Land public transport mode share</td>
<td>The provision of the bus improvements and new capacity will increase land public transport mode share.</td>
</tr>
<tr>
<td></td>
<td>Deliverability</td>
<td>A deliverable plan will be established through detailed technical feasibility.</td>
</tr>
<tr>
<td>Social Inclusion</td>
<td>Providing access for all through better connectivity</td>
<td>Increased bus services supply will close the transit gaps allowing more people access to the system.</td>
</tr>
<tr>
<td>Environment</td>
<td>Improve air quality through modal transfer</td>
<td>Modal transfer will reduce private vehicle kilometres and congestion thus improving air quality.</td>
</tr>
</tbody>
</table>
7 SUMMARY
Chapter 2: Bus Transformation Plan

7 SUMMARY

SPAD has developed the National Land Public Transport Master Plan to set out the vision and direction for land public transport in Malaysia. The purpose is to develop a long-term programme to address the current deterioration in land public transport with plans to execute high impact and effective delivery initiatives for a 20-years sustainable national land public transport service.

The National Land Public Transport Master Plan outlines the National Land Public Transport Policy which provides guidance and direction towards developing the National Master Plan. Included in the National Land Public Transport Master Plan is also a Planning Guideline which provides the guidance on the methodology for setting objectives, plan development, identification of policy measures and assessments of solutions. The Planning Guidelines facilitates the development of Regional Master Plans and enables interfacing with State-specific plans and land use policies.

The first Regional Master Plan developed by SPAD is for the Greater Kuala Lumpur/Klang Valley region. The BTP is one of six Subsidiary Plans of the Greater Kuala Lumpur/Klang Valley Master Plan, and relates to bus transformation in the region. Together these six plans provide an integrated land public transport plan for the Greater Kuala Lumpur/Klang Valley region.

In order to aid the development of the Greater Kuala Lumpur/Klang Valley Master Plan, a series of Guiding Principles have been developed examining issues related to accessibility, capacity, social inclusion and the environment.

Currently land public transport mode share in Greater Kuala Lumpur/Klang Valley is relatively low compared to other major cities and has fallen since the 1980s. This decline is in spite of increased population and households in the region.

The fall in land public transport share reflects the increase of the highway network supply, changes in household characteristics such as reducing household sizes, rise in household incomes, affordability of cars, poor quality of land public transport, and the unreliability of buses.

It is generally agreed that the current delivery of services bus services across the Greater Kuala Lumpur/Klang Valley region is lacking in a number of areas.

Quality of provision is often poor. Network coverage and availability leaves large gaps in the network with often low quality, minimal information and poor reliability. Priority measures to help improve reliability and journey times are not widespread or consistently enforced.

There is an extensive bus network operated by RapidKL, Metrobus and a number of smaller operators.

There is currently a general lack of coordinated planning in the provision of bus services. This lack of planning is borne out by the needs of commercial operators to increase revenues and this therefore results in heavy concentration of bus services on key radial routes.
The existing service pattern focuses on central Kuala Lumpur and is principally concentrated on the main corridors of movement where a high frequency level of service can be found. These tend to be radial routes emanating from Kuala Lumpur where operators are likely to experience high ridership and improved levels of revenues.

There is very little penetration of residential areas and the analysis indicates that very large numbers of people are not within a reasonable walking distance of a bus service.

In addition to a lack of planning, it is also generally agreed that there is a lack of integration both between bus services and bus to rail. This will be crucial to successful future development, particularly to integrate with rail system expansion.

These shortfalls in planning, monitoring and enforcement has resulted in a network which is not integrated, does not meet the needs of the travelling public, delivers anti-competitive practices for operators; and fails in meeting government policies and objectives.

The range of primary and secondary corridors has been defined for the Greater Kuala Lumpur/Klang Valley region. Secondary corridors (BRT) focus on orbital movements and the other centres. Feeders services will ensure that there are linkages between local centres; provide links to main road bus services (including BRT) and to rail services.

The assessment process within the Master Plan considers the role of each mode such that the growing travel demand can be met by the appropriate mode. Bus will provide the role of supporting and feeding the transport system. Bus services will fill in the gaps of the rail network, particularly on secondary corridors and on routes to the centre of Kuala Lumpur not served by rail. Where appropriate these secondary corridors will use BET and BRT. Bus services will also provide local services to suburban centres in their own right.

BTP has been developed, which seeks to deliver an improved network of services; within a regulatory regime which will work for users, operators and public sector entities. The transformation will deliver the standards that the users currently seek; an open and transparent operating environment for operators, as well as contributing to the objectives and policies developed by the government. However in order to achieve these standards there will be a need for a change in the regulatory regime away from an open market or quality licensing system.

In accordance with international best practice, a comprehensive tendering regime based on contracts will secure the services necessary to meet the Plan’s objectives and raise standards.

Prasarana and Rapid Kuala Lumpur will be transformed to support the improvements planned.

The transformation will deliver the standards that the users currently seek; an open and transparent operating environment for operators, as well as contributing to the objectives and policies developed by the government.

A phasing strategy has been derived which best serves the needs of the region. It also indicates one which is sustainable for the future delivery of bus services.

In maximising the use of bus services the first and last miles of a land public transport journey are crucial. Good access to the bus network is crucial.

Measures must be introduced to maximise the benefits of bus services by providing customers with integrated journeys that reduce the barrier of using land public transport.
Chapter 2: Bus Transformation Plan

**Table 7.1: Summary of the Master Plan against the Guiding Principles**

<table>
<thead>
<tr>
<th>Guiding Principle</th>
<th>Review of Master Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consider the planning, integration &amp; co-ordination of all land public transport</td>
<td>The approach adopted has developed a corridor based approach to integrating the land public transport modes. These elements are addressed further in the other Subsidiary Plans.</td>
</tr>
<tr>
<td>modes</td>
<td></td>
</tr>
<tr>
<td>Define modal share targets</td>
<td>Land public transport mode share targets to be addressed in the main Master Plan document. The provision of the bus service improvements will form a key building block in achieving these</td>
</tr>
<tr>
<td>Define complementary policies to allow the land public transport model share to</td>
<td>Integration with Land Use &amp; Demand Management Policies addressed through the subsidiary Plans to allow integration of the Master Plan with Land Use. Stakeholder engagement process is developing those linkages such as between the URDP and City Plan and Structure Plan</td>
</tr>
<tr>
<td>achieve the targets</td>
<td></td>
</tr>
<tr>
<td>Allow land public transport to be socially inclusive to be the mode of choice for</td>
<td>Wider bus service network coverage will increase the catchment areas for bus usage. Good design of the bus service networks and hierarchies will allow access for all users</td>
</tr>
<tr>
<td>all users</td>
<td></td>
</tr>
<tr>
<td>Provide for increased accessibility &amp; connectivity</td>
<td>The improved bus network will increase accessibility and connectivity to and between services</td>
</tr>
<tr>
<td>Take account of the hierarchy of centres; primary centres in particular should be</td>
<td>The design of corridors has taken account of the key centres within the Region. Improved linkages between rail and bus services will link local centres to BRT and rail provision</td>
</tr>
<tr>
<td>served by rail, where possible to encourage modal transfer</td>
<td></td>
</tr>
<tr>
<td>Provide capacity to meet future demands efficiently and reliably to allow the</td>
<td>The bus network will match capacity to demand and will increase accessibility &amp; reduce travel times thus providing benefits to the local economy</td>
</tr>
<tr>
<td>region to grow economically</td>
<td></td>
</tr>
<tr>
<td>Provide additional capacity to serve central Kuala Lumpur given its economic</td>
<td>The bus network includes BRT lines to serve the Kuala Lumpur city centre which will increase accessibility and reduce travel times thus providing benefits to the local economy.</td>
</tr>
<tr>
<td>importance to the country</td>
<td></td>
</tr>
<tr>
<td>Be based on a process of engagement with Stakeholders</td>
<td>This process is on-going through the Master Plan development and will continue through implementation and review</td>
</tr>
<tr>
<td>Take account of previous studies and plans where appropriate</td>
<td>The development of the Master Plan has reviewed previous studies and taken account of the needs of the local authority development plans</td>
</tr>
<tr>
<td>Seek to provide environmental benefits to the region in terms of noise and air</td>
<td>The improvements to the bus network will encourage modal transfer which will reduce car traffic levels allowing improvements to the environment</td>
</tr>
<tr>
<td>quality</td>
<td></td>
</tr>
<tr>
<td>Corridors should be served according to the appropriate mode to meet demands</td>
<td>This is achieved through the Master Plan development process</td>
</tr>
</tbody>
</table>
TAXI TRANSFORMATION PLAN
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1 Background
Chapter 3: Taxi Transformation Plan

1 BACKGROUN

1.1 Introduction

The TTP is to set the basis for the development of taxi services in the Greater Kuala Lumpur/Klang Valley region. Its purpose is to define the standards based on international best practices that should be adopted for taxi operations and to identify the regulatory framework to be adopted for procuring and licensing taxi services in the region that will deliver the vision and proposed service standards.

The TTP proposes the following seven initiatives to drive the transformation of the industry:

• Review regulatory framework
• Improve driver standards
• Improve vehicle standards
• Encourage integration and branding activities
• Improve infrastructure and accessibility
• Establish modal partnerships
• Improve performance monitoring and enforcement

1.2 Structure Of The Taxi Transformation Plan

This chapter provides a summary of the TTP for the Greater Kuala Lumpur/Klang Valley region. The next chapter outlines the existing situation. Chapter 3 provides a series of international examples of best practice. Chapter 4 identifies the Land Public Transport Master Plan proposals and assesses the contribution that taxi can make in the context of Greater Kuala Lumpur/Klang Valley. Chapter 5 sets out an indicative delivery timescale while Chapter 6 provides an overall summary of the TTP.

Key Conclusions

SPAD has developed the National Land Public Transport Master Plan (NLPTMP) to set out the vision and guiding principles for land public transport in Malaysia.

The objective of the NLPTMP is to drive the development of the NLPTMP, which comprises of Regional master plans and Sector Plans.

The NLPTMP provides a Planning Toolkit to guide the development of Regional Master Plans.

The first Regional Master Plan developed by SPAD is for the Greater Kuala Lumpur/Klang Valley region, the Greater Kuala Lumpur/Klang Valley Master Plan.

The TTP is one of six subsidiary plans of the Greater Kuala Lumpur/Klang Valley Master Plan.

The TTP defines the standards based on international best practices that should be adopted for taxi operations and identifies the regulatory framework to be implemented.
2 ASSESSMENT OF CURRENT CONDITIONS
Chapter 2: Taxi Transformation Plan

2 ASSESSMENT OF CURRENT CONDITIONS

2.1 Introduction

Chapter 2 provides an outline of the key considerations in the development of the Greater Kuala Lumpur/Klang Valley Master Plan. The starting point is the understanding of the existing conditions in the Greater Kuala Lumpur/Klang Valley region in relation to taxi. This is based on engagement with stakeholders to collate data and identify key problems and issues.

2.2 Regional Master Plan Development

In developing the Regional Master Plans, a process of 9 stages are undertaken as outlined in Figure 2.1. Having identified the existing situation through analysis of data and stakeholder engagement, a review of the forecast travel situation in the region is identified. The key factors in the assessment are travel demands, including population (and employment), accessibility, travel pattern and travel time. Additionally, other considerations such as network, land use and known technical constraints are assessed (see Figure 2.1). Land use data is assembled from local authorities to reflect future population and employment changes identified in Structure Plans and Local Plans. The Regional Master Plan ensures alignment of state-level public transport plans and the National Land Public Transport Policy, whilst placing importance on inclusion of state-specific requirements. This is achieved through a consultive process and collaboration between State authorities and SPAD in developing the Regional Master Plans. Additionally, the Regional Master Plans recognise the need for consistency between state plan directives and the necessity for public transport. Therefore the Regional Master Plan takes account of the location of major development areas which need to be served by public transport.

Figure 2.1: Key Considerations in the Master Plan Assessment

A transport model has been used to assess future travel patterns resulting from the land uses and assuming different network scenarios. The resulting travel time and accessibility patterns have been mapped against the existing situation of taxi.
2.3 Greater Kuala Lumpur/Klang Valley Demographics

The 2010 census identified a regional population of 6.3 million compared with 4.6 million in 2000 and 3.0 million in 1990 (see Table 2.1). Although the percentage change at 37% from 2000 to 2010 is lower than in the previous decade the magnitude of change is similar with an additional 1.7 million people in the region during the decade.

The largest percentage growth is to the south and west of Kuala Lumpur in districts such as Sepang, Petaling Jaya and Putrajaya. The magnitude of growth in Kuala Lumpur between 2000 and 2010 was also higher than the previous decade (320,000 compared to 160,000).

The number of households has grown by 59% in the last decade with the total number of households in the region being 1.66 million households. The net result of these changes is that the average household size has fallen from 4.81 persons per household in 1991 to 4.46 in 2000 and 3.83 in 2010. This change is seen in all districts across the study area and has contributed to increase travel demands.

Population and employment densities have been mapped out below and overall, they show higher population densities, mainly in suburbs of Kuala Lumpur and the regional centres such as Shah Alam, Klang and Petaling Jaya (see Figure 2.2). The greatest concentrations of employment are in the city centre of Kuala Lumpur. Recent trends have highlighted the increasing concentration of employment in the major centres which

<table>
<thead>
<tr>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Gombak</td>
<td>352,649</td>
<td>537,525</td>
<td>682,996</td>
<td>52%</td>
<td>27%</td>
<td>72,781</td>
<td>115,475</td>
<td>171,718</td>
<td>59%</td>
<td>49%</td>
</tr>
<tr>
<td>Klang</td>
<td>406,994</td>
<td>643,436</td>
<td>848,149</td>
<td>58%</td>
<td>32%</td>
<td>77,878</td>
<td>165,327</td>
<td>206,262</td>
<td>74%</td>
<td>52%</td>
</tr>
<tr>
<td>Petaling</td>
<td>633,165</td>
<td>1,184,180</td>
<td>1,782,375</td>
<td>87%</td>
<td>51%</td>
<td>132,230</td>
<td>268,287</td>
<td>481,954</td>
<td>103%</td>
<td>80%</td>
</tr>
<tr>
<td>Sepang</td>
<td>48,941</td>
<td>97,139</td>
<td>212,050</td>
<td>98%</td>
<td>118%</td>
<td>9,504</td>
<td>18,952</td>
<td>50,444</td>
<td>99%</td>
<td>166%</td>
</tr>
<tr>
<td>Ulu Langat</td>
<td>413,900</td>
<td>864,451</td>
<td>1,141,880</td>
<td>109%</td>
<td>32%</td>
<td>87,285</td>
<td>193,765</td>
<td>292,177</td>
<td>112%</td>
<td>51%</td>
</tr>
<tr>
<td>Selangor sub total</td>
<td>1,855,649</td>
<td>3,326,731</td>
<td>4,667,450</td>
<td>79%</td>
<td>40%</td>
<td>379,678</td>
<td>731,806</td>
<td>1,202,555</td>
<td>93%</td>
<td>64%</td>
</tr>
<tr>
<td>WP Kuala Lumpur</td>
<td>1,145,342</td>
<td>1,305,792</td>
<td>1,627,172</td>
<td>14%</td>
<td>25%</td>
<td>224,267</td>
<td>308,006</td>
<td>436,856</td>
<td>26%</td>
<td>42%</td>
</tr>
<tr>
<td>WP Putrajaya</td>
<td>5,730</td>
<td>11,501</td>
<td>67,964</td>
<td>101%</td>
<td>491%</td>
<td>1,022</td>
<td>2,152</td>
<td>19,692</td>
<td>111%</td>
<td>815%</td>
</tr>
<tr>
<td>Greater Kuala Lumpur/Klang Valley</td>
<td>3,006,721</td>
<td>4,644,024</td>
<td>6,362,586</td>
<td>54%</td>
<td>37%</td>
<td>624,967</td>
<td>1,041,964</td>
<td>1,659,112</td>
<td>67%</td>
<td>59%</td>
</tr>
<tr>
<td>Kuala Langat</td>
<td>130,090</td>
<td>192,176</td>
<td>222,261</td>
<td>48%</td>
<td>16%</td>
<td>24,388</td>
<td>38,309</td>
<td>50,417</td>
<td>57%</td>
<td>32%</td>
</tr>
<tr>
<td>Kuala Selangor</td>
<td>123,052</td>
<td>161,168</td>
<td>210,406</td>
<td>31%</td>
<td>31%</td>
<td>23,618</td>
<td>32,455</td>
<td>49,419</td>
<td>37%</td>
<td>52%</td>
</tr>
<tr>
<td>Sabak Bernam</td>
<td>99,824</td>
<td>113,245</td>
<td>106,158</td>
<td>13%</td>
<td>-6%</td>
<td>20,122</td>
<td>24,258</td>
<td>25,443</td>
<td>21%</td>
<td>5%</td>
</tr>
<tr>
<td>Ulu Selangor</td>
<td>82,814</td>
<td>147,996</td>
<td>205,049</td>
<td>79%</td>
<td>39%</td>
<td>17,314</td>
<td>32,464</td>
<td>48,035</td>
<td>88%</td>
<td>48%</td>
</tr>
<tr>
<td>Selangor</td>
<td>2,291,429</td>
<td>3,941,316</td>
<td>5,411,324</td>
<td>72%</td>
<td>37%</td>
<td>465,120</td>
<td>859,292</td>
<td>1,375,869</td>
<td>85%</td>
<td>60%</td>
</tr>
</tbody>
</table>

(Source: Census 2010)
has implications for the choice of appropriate modes to serve these centres. In areas where the concentrations of demands are highest, rail is the most effective and efficient transport mode for that area.

2.4 Current Taxi Vehicle Classes

There are several classes of vehicle licensed in Greater Kuala Lumpur/Klang Valley which form the taxi industry. The classes and definitions are shown in Table 2.2. The categories of taxis are defined as follows:

- **Executive** which caters for the city’s affluent visitors and business travellers.
- **Budget** which are found across the region.
- **Premier**, which sat between the budget and Executive classes, is currently being phased out due to the overlap with the executive class and no new licences are being issued.
- **Others** are airport taxis exclusively serve airport passengers whilst limousines and hired cars are contracted to hotels and several areas respectively.

The core taxi market, Budget and Executive vehicles are the focus of this TTP.
An analysis of the number of licences has been carried out and Tables 2.3 and 2.4 show the results of the analysis for the Budget and Executive vehicle fleets. It is clear that the budget sector is the main taxi market across Greater Kuala Lumpur/Klang Valley with over 29,000 licences in the budget class and 1,500 licences in the Executive class. Budget therefore represents 95% of taxi licences and Executive the remaining 5% of the market.

### Table 2.2: Comparison of Current Vehicle Classes

<table>
<thead>
<tr>
<th>Vehicle Class</th>
<th>Sub class</th>
<th>Operational Area</th>
<th>Purpose</th>
<th>Operated by</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taxi</td>
<td>Budget</td>
<td>Klang Valley (incl. Seremban), Johor Bahru, Pulau Pinang, Malacca, Kuala Terengganu</td>
<td>Short distance travel</td>
<td>Individual &amp; company</td>
</tr>
<tr>
<td></td>
<td>Premium (Phased out)</td>
<td>Kuala Lumpur Sentral</td>
<td>Affluent travelers</td>
<td>Individual &amp; company</td>
</tr>
<tr>
<td></td>
<td>Executive</td>
<td>All of Peninsular Malaysia</td>
<td>Affluent travelers</td>
<td>Individual &amp; company</td>
</tr>
<tr>
<td>Limousine</td>
<td></td>
<td>Hotels (except airport)</td>
<td>Hotel guests</td>
<td>Company</td>
</tr>
<tr>
<td>Airport Taxi</td>
<td></td>
<td>KLIA, LCCT, LTL, LTABL</td>
<td>Airport travellers</td>
<td>Company</td>
</tr>
<tr>
<td>Hired Car (yellow top)</td>
<td></td>
<td>Nation-wide</td>
<td>Long distance travel</td>
<td>Individual &amp; company</td>
</tr>
</tbody>
</table>

### Table 2.3: Budget Taxi Class - Licences by Region and Company/Individual

<table>
<thead>
<tr>
<th></th>
<th>Selangor</th>
<th>Kuala Lumpur</th>
<th>Other Areas</th>
<th>Grand Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual</td>
<td>Licenses</td>
<td>5,090</td>
<td>4,812</td>
<td>4,170</td>
</tr>
<tr>
<td>Companies</td>
<td>Licenses</td>
<td>6,765</td>
<td>12,773</td>
<td>2,476</td>
</tr>
<tr>
<td>Operators</td>
<td></td>
<td>123</td>
<td>86</td>
<td>179</td>
</tr>
<tr>
<td>Total Vehicles</td>
<td></td>
<td>11,855</td>
<td>17,585</td>
<td>6,646</td>
</tr>
</tbody>
</table>

### Table 2.4: Executive Taxi Class - Licences by Region and Company/Individual

<table>
<thead>
<tr>
<th></th>
<th>Selangor</th>
<th>Kuala Lumpur</th>
<th>Other Areas</th>
<th>Grand Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual</td>
<td>Licenses</td>
<td>259</td>
<td>163</td>
<td>127</td>
</tr>
<tr>
<td>Companies</td>
<td>Licenses</td>
<td>130</td>
<td>971</td>
<td>92</td>
</tr>
<tr>
<td>Operators</td>
<td></td>
<td>19</td>
<td>24</td>
<td>13</td>
</tr>
<tr>
<td>Total Vehicles</td>
<td></td>
<td>389</td>
<td>1,134</td>
<td>219</td>
</tr>
</tbody>
</table>

In addition to the Budget and Executive taxis there are 531 Airport Taxis registered in Kuala Lumpur and 2044 registered in Selangor. There are also 252 and 785 limousines registered in Kuala Lumpur and Selangor respectively. Finally there are also 1055 and 449 Hired Cars registered in Kuala Lumpur and Selangor respectively.

### 2.5 Vehicle Specification

The vehicle specifications for the Budget and Executive vehicles have been reviewed and are summarised in Table 2.5. The specifications for Budget class state that only national cars can be licensed which provides a choice of three Proton vehicles. A variety of national and international vehicles are permitted to be licensed as Executive class. The specifications do not detail any seat, leg, or headroom dimensions for Budget vehicles. For Executive vehicles the internal width must be greater than 1400mm. Furthermore it is noted that although there is an age limit of 10 years for a Budget vehicle, the first registration of the vehicle as a taxi can occur at anything up to 10 years which is likely to encourage the trade and relicense of older vehicles. Overall the standards are minimal but restrictive in the choice of vehicle - particularly for the Budget class.
Chapter 3: Taxi Transformation Plan

2.6 Licensing Requirements And Process

Currently (June 2011) a separate licence is required for the vehicle and for the driver. The responsibility for licensing is split across a number of agencies. SPAD maintain responsibility for the vehicle licensing process while JPJ are responsible for driver licensing. It is mandatory for the driver to have a 1 year Competent Driving Licence (CDL); a fully-fledged driving licence that is upgraded from the probationary licence after 2 years before they could apply for Public Vehicle License (PSV). The driving licence may be renewed after every 1, 2, 3 or 5 years. A grace period of three years is given to renew the licence before the licence holder may need to restart the whole driving lesson procedures. The Class of license for taxi driver is Class D which is the cars with unloaded weight not exceeding 3000 kg. A driver should be at least 21 years old and being approved by registered doctor that they are healthy and free from any form of physical deformities. After undergoing the courses, the applicants need to sit a practical test that consist of 50 objectives questions at JPJ officials driving institute premises. Having completed the practical test, the license would be granted by JPJ within a week.

The applicants could apply for the vehicle license separately from the driver license. In order to obtain the license, they have to fill in and submit the form together with the attachment needed as shown in Figure 2.3.

<table>
<thead>
<tr>
<th>Item</th>
<th>Budget Taxi</th>
<th>Executive Taxi</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of car</td>
<td>Saloon style national car:</td>
<td>Saloon/ Multi Utility Vehicle ( MUV)</td>
</tr>
<tr>
<td></td>
<td>Iswara</td>
<td>Saloon Style Vehicles</td>
</tr>
<tr>
<td></td>
<td>Waja</td>
<td>Nissan Cefiro</td>
</tr>
<tr>
<td></td>
<td>Saga BLM</td>
<td>Mercedes Benz E200</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Proton Perdana</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Nissan Sylphy</td>
</tr>
</tbody>
</table>

| Specifications | Door : Usual Door | Door : Sliding Door |
|               | Must have air -Conditioning | Must have air -Conditioning |

| Engine capacity | Greater than 1450 c.c | Greater than 1950 c.c |
|                | Under 1950 c.c |

| Bonnet Capacity | >3.5m² | > 0.5 m² |

| Internal Width | Not specified | > 1400 mm |

| Colour         | Blue Reflex Blue 11334: Nexa auto colour | Candy Blue, CT005-Special Colour, Mercury Pain |
|               | Red(Chilli red A0158: ICI paint) | Operators can specify own livery |

| Age            | First Register : up to 10 years | First Register : up to 3 years |
|               | Usage : up to 10 years | Usage : up to 10 years |

Table 2.5: Current Vehicle Specifications by Class
The vehicle license applications are then circulated to the SPAD to decide either the applicant would be accepted or declined. Figure 2.4 below indicates the licensing process for a vehicle.

Licences issued for both Budget and Executive class vehicles are for an initial period of 7 years if the vehicle is licence from new. If the vehicle presented is not new then the licence is issued for 7 years minus its age. At 7 years licences are issued for a further 3 years.

Table 2.6 shows the requirements for operators registering to SPAD to operate taxis. The requirements are different between individuals and companies. These are currently under review by SPAD.

Figure 2.3: Flow Chart of Licensing Process and Requirement Needed

Figure 2.4: Flow Chart of Vehicle Licensing Process
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2.7 Age Of Vehicles

Both Budget and Executive taxis are permitted to be licensed up to 10 years of age. An analysis of the current age of the fleet shows that some 52% of the Budget fleet are aged between 5 to 8 years old. This indicates the fleet is aging and there is a risk that quality will further reduce over the next 2 to 3 years as the vehicles reach the end of their permitted licensing period. The Executive fleet was only introduced 6 years ago therefore the fleet are relatively young in comparison to the Budget fleet.

<table>
<thead>
<tr>
<th>Type</th>
<th>Individual Company</th>
<th>Company Sdn. Ltd., Company Limited, Cooperative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taxi</td>
<td>Malaysian citizen aged not more than 60 years old and in good health.</td>
<td>Registered with the Companies Commission of Malaysia (SSM).</td>
</tr>
<tr>
<td>Hired car</td>
<td>Registered with the Companies Commission of Malaysia (SSM).</td>
<td>Having accumulated capital equivalent to 30% of the cost of the vehicle.</td>
</tr>
<tr>
<td>Hired/Drive car</td>
<td>Having accumulated capital equivalent to 30% of the cost of the vehicle.</td>
<td>Eligible to apply for a licence only.</td>
</tr>
<tr>
<td></td>
<td>Minimum driving experience for 5 years</td>
<td>Has a Public Vehicle License (PSV) which is still valid.</td>
</tr>
<tr>
<td></td>
<td>Does not hold any government position.</td>
<td>Net of crime, drugs and traffic offenses.</td>
</tr>
<tr>
<td>Limousine</td>
<td></td>
<td>Additional requirement has a contract with the hotel (ranked 4 stars and above) for regular services</td>
</tr>
</tbody>
</table>

Table 2.6: Current Operator Requirements

Figure 2.5: Fleet Age Profile Budget Red, Executive Blue
2.8 Fare Structure

The fare structure consists of a flag or hail charge for the first kilometre after which the fare is determined by a combination of time and distance. This is the usual approach for fare setting which is adopted globally. There is also a supplement payable for hiring after midnight and for telephone bookings. Fares were last reviewed in 2009 when a 35% increase was applied to the tariffs. Any increase in fare must be approved by the Malaysian Prime Minister. There is currently no system in place to look at regular incremental changes in operating costs and earnings. Table 2.7 details the current fare structure for the 2 classes of taxi. The Executive fare is approximately 50% higher than the Budget fares.

Table 2.7: Fare Structures in Malaysia

<table>
<thead>
<tr>
<th>License</th>
<th>Locations</th>
<th>Fare structure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taxi Budget</td>
<td>Penang</td>
<td>Distance</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RM4/ first 1 km</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10 cents/ next 115m</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Time</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RM4/ first 3 min</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10 cents/ next 21 seconds</td>
</tr>
<tr>
<td>Klang Valley,-</td>
<td>Johor Bahru, Kuala, Terengganu,</td>
<td>Distance</td>
</tr>
<tr>
<td>Budget</td>
<td>Melaka</td>
<td>RM4/ first 1 km</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10 cents/ next 115m</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Time</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RM4/ first 3 min</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10 cents/ next 21 seconds</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Extras</td>
</tr>
<tr>
<td></td>
<td></td>
<td>50% surcharge after midnight</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RM3 telephone booking charge</td>
</tr>
<tr>
<td>Executive</td>
<td>Klang Valley,- Executive</td>
<td>Distance</td>
</tr>
<tr>
<td></td>
<td>Johor Bahru, Kuala, Terengganu,</td>
<td>RM6/ first 1 km</td>
</tr>
<tr>
<td></td>
<td>Melaka</td>
<td>20 cents/ next 115m</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Time</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RM6/ first 3 min</td>
</tr>
<tr>
<td></td>
<td></td>
<td>20 cents/ next 21 seconds</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Extras</td>
</tr>
<tr>
<td></td>
<td></td>
<td>50% surcharge after midnight</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RM3 telephone booking charge</td>
</tr>
<tr>
<td>AirPort Taxi</td>
<td>KLIA, LCCT</td>
<td>Zone based charges (coupon)</td>
</tr>
<tr>
<td>Hired Car</td>
<td>Air Conditioned</td>
<td>21.6 cents/km + 50 cents surcharge for each passenger</td>
</tr>
<tr>
<td></td>
<td>Non - Air Conditioned</td>
<td>25 cents/km + 50 cents surcharge for each passenger</td>
</tr>
</tbody>
</table>
### Table 2.8: Voucher Based Taxi Stands

<table>
<thead>
<tr>
<th>Item</th>
<th>Operator</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Puncak Holdings Sdn. Bhd.</td>
<td>Kuala Lumpur Sentral (3 counters)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hentian Duta</td>
</tr>
<tr>
<td>3</td>
<td>Koperasi Pengangkutan Awam Putrajaya &amp; Cyberjaya Berhad</td>
<td>Putrajaya Sentral</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Stesen KTM Serdang</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Jabatan Imigresen Putrajaya</td>
</tr>
<tr>
<td>4</td>
<td>Top Station Sdn. Bhd.</td>
<td>Berjaya Times Square</td>
</tr>
<tr>
<td>5</td>
<td>Bakti Raya Sdn. Bhd.</td>
<td>Sunway Lagoon</td>
</tr>
<tr>
<td>6</td>
<td>Edaran Impian Sdn. Bhd.</td>
<td>One Utama Shopping Centre</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The Mines</td>
</tr>
<tr>
<td>7</td>
<td>D-One Impian Sdn. Bhd.</td>
<td>Giant Bandar Kinrara, Puchong</td>
</tr>
<tr>
<td>8</td>
<td>Teratai Terbilang Sdn. Bhd.</td>
<td>Subang Skypark</td>
</tr>
<tr>
<td>9</td>
<td>Gabungan Persatuan Teksi Berdaftar Johor Bahr (GAPET)</td>
<td>Eastern Hub, JB Sentral</td>
</tr>
<tr>
<td>10</td>
<td>Koperasi Mitra Usahawan Berhad</td>
<td>Terminal Bersepadu Selatan</td>
</tr>
<tr>
<td>11</td>
<td>Visi Melati Sdn. Bhd.</td>
<td>Midvalley/Garden</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The Curve</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The Mall</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Solaris Mont Kiara</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Farenheight</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lot 10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Terminal Bersepadu Selatan</td>
</tr>
</tbody>
</table>
2.9 Taxi Stand And Telephone Bookings

Taxi stands are located across the region but there is no central database of information specifying where stands are located, or their capacity and operational times. Coverage across Greater Kuala Lumpur/ Klang Valley inconsistent as stands provided in key locations such as major terminals, the main tourist locations and major shopping centres they are operated in different ways which can cause some confusion and reluctance amongst the drivers and public to use taxi stands. Many drivers do not operate from taxi stands at all and simply circulate plying for hire on the street. Taxis Stands can be operated in the following ways:

- Voucher prepay system - fare is prepaid at a booth based on the stated destination and the voucher presented to the driver who does not then use the meter. Typically vouchers are RM 2 to RM 4 more expensive than the metered fare and this surcharge pays for the administration of the scheme and the marshals’ who direct passengers to taxis. (For example: Kuala Lumpur Sentral)
- Manned taxi stand - RM2 surcharge is paid in cash to the administrator on the taxi stand who directs passengers to cabs. Taxi driver then operates the meter and the fare is payable as usual. (Example: KLCC)
- Unmanned or manned - taxi charged by the meter and no surcharge payable. (Example outlying shopping centre ranks)
- Informal taxi stands - queues of taxis on the road where no taxi stand appears to exist but drivers believe there is a demand.

The operators of some taxi stands charge drivers to ply at particular stands. For example, it is understood drivers must pay RM100 per month in order to obtain a badge allowing them to ply for hire at Kuala Lumpur Sentral.

Although most passengers obtain their taxi by walking outside to a taxi stand or flagging a vehicle in the street as it passes, taxis may also be booked by telephone. There are a number of telephone operations across Greater Kuala Lumpur/Klang Valley. However it is understood from public comments that telephone booking is perceived to be unreliable and so not the preferred method of hire. The majority of the taxi fleet do not operate with radio circuits and are therefore unable to be dispatched to a telephone booking easily. There is an initiative among 17 taxi operators to equip their fleet with radios in the Greater Kuala Lumpur/ Klang Valley region.

Although operators take telephone bookings they estimate the percentage of calls not met is up to 60%. Anecdotally it is understood drivers will not accept bookings unless they are in the immediate area or they would be out of pocket travelling to the fare - even allowing for the RM3 surcharge.

2.10 Current Taxi Operating Costs And Revenues

A review of taxi operating costs has been carried out for the Master Plan. Operating costs will vary from driver to driver and vehicle to vehicle depending on their driving style, how the taxi is operated and how it is maintained. This review relates to an average case. The variable and fixed costs associated with either purchasing a vehicle over a five year period or leasing a vehicle from a company operator have been established along with the estimated maintenance costs associated with carrying out the manufacturers recommended maintenance schedule. The costs allow for labour, parts and insurance. Based on feedback from taxi operators relating to daily kilometres travelled an estimated cost of fuel has also been established. Together the figures set out average monthly outgoings. The figures exclude extra optional outgoings such as the payment of fees to ply at particular locations such as Kuala Lumpur Sentral.
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An assessment of average revenues has been undertaken based on the feedback provided from operators. This estimates that 40% of distance travelled is fare paying and some 375 km are travelled on average per day. It was also suggested that it was possible to obtain up to RM17 per hour in fares. Based on these assumptions and the operating costs set out in the previous section it is estimated that an individual driver could potentially make up to RM36,000 per annum based on a working day of 12 hours and working 29 days per month. The Kuala Lumpur City Plan states that the average household income in Kuala Lumpur is higher than anywhere else in the country and stood at RM 5,488 per month in 2009. Although the taxi driver net revenue is less than average earnings across Kuala Lumpur the figures are understood to be comparable with the wage levels of bus drivers in the region.

2.11 Operation Of The Market

There is little information available on the balance between the supply and demand of taxi services in the Greater Kuala Lumpur/Klang Valley region. The evidence reviewed suggests that there is a general abundance of taxis available across the area, however the inherent variations in demand temporally and geographically inevitably result in a disparity between available supply and passenger demand at certain times or locations. This is completely normal characteristic of taxi markets globally as it is generally accepted that it is impractical to provide for peaks in demand. The result would be increased congestion and over competition at non peak times which in turn result in a reduction of quality as drivers and operators may choose to cut corners on maintenance, not use the meter or work increased hours in an attempt to maintain their income levels.

There is a need to begin collection of data in order to assist future understanding of the supply - demand relationship across Greater Kuala Lumpur/Klang Valley and the peculiarities of the market operations in this region.

2.12 Stakeholder Engagement- The Industry Concerns

Consultation has been undertaken with taxi operators to understand their key concerns for the taxi industry now and its future role. The number one concern of the industry in the Greater Kuala Lumpur/ Klang Valley region surrounds the issue of congestion. It was

<table>
<thead>
<tr>
<th>Item</th>
<th>Monthly Costs (vehicle hire purchase)</th>
<th>Monthly Costs (vehicle rent)</th>
<th>Assumptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vehicle Hire Purchase Cost</td>
<td>RM 592</td>
<td>-</td>
<td>The car model assumed is a SAGA (based on the full on-the-road package over 7 years)</td>
</tr>
<tr>
<td>Vehicle Rent</td>
<td>-</td>
<td>RM1,276</td>
<td>The car model used is SAGA with approximately rental fee RM44/day X 29 days</td>
</tr>
<tr>
<td>Maintenance and Insurance</td>
<td>RM355</td>
<td>RM355</td>
<td>Calculations based on 350km/day x 29 days</td>
</tr>
<tr>
<td>Fuel</td>
<td>RM609</td>
<td>RM609</td>
<td>Calculations based on 350km/day X 29days</td>
</tr>
<tr>
<td>Total Cost</td>
<td>RM 1,556</td>
<td>RM2,240</td>
<td></td>
</tr>
</tbody>
</table>
reported that congestion increases driver stress and has a direct impact on the ability of drivers to achieve the level of takings they require to break even in a day. As a result, it is reported that the average number of hours worked per day is increasing along with the numbers of days worked in an attempt to maintain the level of takings. As congestion and the number of hours work required to achieve the takings required in a day increases, it is natural that drivers will be increasingly tempted to haggle for fares rather than relying on the metered fare in order to try mitigating against time stuck in traffic congestion.

Taxi operators indicated that their key congestion hotspots were in Kuala Lumpur, particularly on key radials accessing the centre of Kuala Lumpur. The locations can be summarised as:

- Jalan Ampang
- Jalan Bukit Bintang
- Jalan Tun Razak
- Jalan Sultan Ismail
- Jalan Ipoh
- Jalan Sentul
- Jalan Tuanku Abdul Rahman
- Jalan Kuching
- Jalan Cheras
- Jalan Kelang Lama
- Brickfields
- Lebuhraya Persekutuan

The operators believe that the provision of taxi (or taxi and bus) priority lanes on key routes would reduce stress levels and help increase the efficiency of their operations through; improved and more reliable journey times, encouraging access to congested areas there is a reluctance to serve at the current time, and improving earning potential. There are a limited number of bus lanes provided in Kuala Lumpur (as outlined in the Bus Transformation Plan). Typically these routes are not enforced and the operators highlighted this as a step which would be required in order to have effective bus and taxi lanes across Kuala Lumpur.

Road conditions also affect driver and passenger comfort, journey reliability and can damage the vehicles reducing their vehicle life. There is a need for swift road maintenance to address the numerous potholes and help maintain vehicle condition.

Operators have reported that the nature of the taxi market across the Greater Kuala Lumpur/Klang Valley region has been changing as congestion levels have increased. They report there has been a marked reduction in long haul trips and the majority of fares are now short distance (up to 4-5 km) or providing a journey stage for example transporting passengers to Kuala Lumpur Sentral rather than the whole trip to the airport.

The operators estimate 30% of their passengers are tourists rather than local residents and the most profitable time of the day is usually mid morning. They estimate drivers typically drive over 375km per day with only 30-40% of km travelled fare paying. This is in marked contrast to other cities, for example they estimate in Singapore fare paying km stand at around 70% and in Hong Kong 80%. It is recognised that taxis are not often double shifted which can reduce availability at certain times of day. In addition, individual licence plate holders will often use the vehicle as a family car for example at school run times further reducing supply at key periods of the day. Despite this operators believe supply exceeds demand throughout the day, and there are too many taxis operating across the region, and therefore licence numbers should be capped.

Operators are generally unhappy with the current budget vehicle specifications. They recognise customers want more space and they would like the opportunity to be allowed larger vehicles to meet customer demand. However it is noted that the fare structure determines the vehicles they can afford to purchase and on the current budget structure they would struggle to purchase a vehicle above the RM 43,000 price point. There is a perception that spare parts and maintenance are expensive and there is also no allowance or subsidy for the installation of NGV.

The operators consulted highlighted there are industry wide problems relating to driving standards. It was recognised there are good and bad drivers but a lack of monitoring, enforcement and training allow driving standards to vary significantly. Operators believe fewer people are choosing taxi driving as a career and it is not seen as a skilled industry. They believe there needs to be an accredited driver training programme introduced in order to improve service delivery and raise standards within the industry. It is considered
that this needs to cover a wide range of subjects including; driving skills, customer service, health and hygiene and the knowledge. Operators state they do not obtain sufficient return in order to pay for training and that tourism monies should be used to develop a course to raise standards across the industry.

A key problem that the consulted operators raised as an issue across the industry was the practice of drivers jumping from one company to another. There is no way of tracking a drivers’ history, their performance and any convictions or problems and operators want to make sure the drivers they employ are suitable and providing good service to their customers.

Operators were concerned at the lack of long term transport policy, particularly taxi policy and changes to the licensing systems. They were happy for SPAD to set future policy but wanted to be consulted and a suitable long term policy to be set and not tampered with every year. This is important as it allows companies to set business forecasts and understand the level of investment they can make in their business. There is a current reluctance to invest in new vehicles or renew them prior to the age limit due to uncertainties in future policy.

Operators stated there were too many taxi associations and not all companies and drivers joined the associations. This made any changes in policy difficult to communicate to all drivers and operators.

Operators suggested it would be sensible for SPAD to take over the issuing of taxi driver cards and PSV licences from JPJ as SPAD is in charge of public transport. This would make licensing, regulation and enforcement easier to manage and monitor.

2.13 Public Concerns

Public feedback on taxi services has been obtained through examination of recent customer complaints and the latest Pemandu Q3 2010 NKRA Baseline Survey.

The survey assessed public transport users’ satisfaction levels with the service they received. Figure 2.6 shows 89% of taxi users found the service provided satisfactory or acceptable. Taxi users displayed the second highest satisfaction levels behind LRT users. It is recognised that these figures only represent service users and in order to understand satisfaction levels across the wider population it is important to undertake wider reaching public attitude surveys with both service users and non users. It is likely that a satisfaction measurement which includes non users will therefore be lower meaning that overall satisfaction levels are likely below the current 89% quoted.

Other customer feedback has been obtained from a log of customer complaints received by the central complaints management division. The operator consultation highlighted that complaints are not always reported to the official body and that operators receive, investigate and deal with customer complaints themselves in parallel to the official processes. The implication is that there is no central comprehensive log of customer concerns as some are never officially reported by the operators receiving them.

Of the official concerns reported by the public the key themes can be divided into three areas; drivers, vehicles and overall journey experience. These can be summarised in Table 2.10:
Chapter 3: Taxi Transformation Plan

Key Conclusions

Population and employment forecasts show significant growth in the Greater Kuala Lumpur/Klang Valley region.

Public transport including taxi will be required to evolve to meet the additional travel demands to help prevent worsening congestion.

There are few quality requirements in existing licensing processes until 2011.

There is an aging and deteriorating taxi fleet although there are a large number of vehicles due for renewal in 2 to 4 years time.

Operators would welcome quality improvements - want to address industry standards.

There a number of public concerns mainly related to the quality of the taxi service.

There is a lack of baseline data on supply and demand.

### Table 2.10: Public Transport Users Concerns

<table>
<thead>
<tr>
<th>Driver Factors</th>
<th>Vehicle Factors</th>
<th>Journey Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reckless drivers</td>
<td>Lack of headroom and legroom</td>
<td>Unreliable overall taxi service</td>
</tr>
<tr>
<td>Rude Drivers/Lack of customer service</td>
<td>Vehicles too small to take luggage</td>
<td>No single number to source taxi services</td>
</tr>
<tr>
<td>Lack of knowledge on destinations/roads</td>
<td>Difficult to find infant or disabled friendly taxis</td>
<td>Congestion results in long journey times</td>
</tr>
<tr>
<td>Overcharging/Refusing to use meter</td>
<td>Vehicles not maintained and in poor condition</td>
<td>Road condition (potholes) results in uncomfortable ride</td>
</tr>
<tr>
<td>Drivers “cherrypick” passengers and refuse to serve congested destinations</td>
<td>Vehicles shabby and smelly</td>
<td></td>
</tr>
<tr>
<td>Drivers pick up multiple passengers</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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LOOKING TO THE FUTURE OF TAXIS
Chapter 3: Taxi Transformation Plan

3

LOOKING TO THE FUTURE OF TAXIS

3.1 Introduction

This chapter considers international best practice in terms of taxi licensing and benchmarks provision in the Greater Kuala Lumpur/Klang Valley region against other global cities. It then considers the future role of the taxi, taxi licensing and provision. It sets out the resultant overarching vision for taxi services in the Greater Kuala Lumpur/Klang Valley along with the key objectives recommended to help achieving the vision and addressing the issues highlighted in Chapter 2.

3.2 International Best Practice

A review of international best practice has been undertaken in order to understand which elements of the respective taxi systems work well elsewhere, which elements do not work and establishing how the different approaches to the taxi market can be best applied to the Greater Kuala Lumpur/Klang Valley region. The cities considered include those that have been recognised as having the best taxi services in the world, London and New York. It is commonly considered that London Taxis and New York Yellow Cabs provide a good service to their users whilst acting as an icon or brand for the cities. The approach to service provision and licensing requirements in each of these cities has been reviewed along with other core cities including Hong Kong and Singapore. Tables 3.1 - 3.4 set out a summary of the regulatory body, the driver and vehicle standards, and the monitoring and enforcement regime in the taxi market in each city.

It is clear that it is common for the regulator to introduce quality restrictions on licensing although some cities also regulate the number of licences available. Of the cities reviewed just 3 places regulate taxi licensing by controlling numbers, New York, Sydney and some United Kingdom authorities. Where numbers are controlled there are also quality regulations in place – which shows all regulators agree some quality restriction is required and numerical limitation itself is insufficient to ensure quality and maintain public safety.

The requirements for applying for a driver’s license are stringent in New York, London and Singapore. Putting in place quality requirements ensures only those suitable to work as drivers enter the industry and the quality of drivers are therefore assured. Likewise by specifying detailed vehicle standards and testing and monitoring regularly against these standards the quality of the fleet is maintained.

Figure 3.1: Iconic Image of Taxis in New York and London
### Table 3.1: International Taxi Market - Comparison of regulation

<table>
<thead>
<tr>
<th>Country, City</th>
<th>Regulator</th>
<th>Classes of Vehicle</th>
<th>Driver Licensing</th>
<th>Vehicle Licensing</th>
<th>Operator Licensing</th>
<th>Number Capped</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malaysia (KL)</td>
<td>SPAD</td>
<td>Taxi (budget, executive, premier)</td>
<td>JPJ</td>
<td>SPAD</td>
<td>Introducing for all</td>
<td>✗</td>
</tr>
<tr>
<td>England (London)</td>
<td>Transport for London</td>
<td>Hackney Carriage Private Hire</td>
<td>TIL</td>
<td>TIL</td>
<td>PH only</td>
<td>✗</td>
</tr>
<tr>
<td>England (Outside London)</td>
<td>Local Authorities</td>
<td>Hackney Carriage Private Hire</td>
<td>Local Licensing Department</td>
<td>Local Licensing</td>
<td>PH only</td>
<td>✗</td>
</tr>
<tr>
<td>USA, New York</td>
<td>Taxi and Limousine Commission</td>
<td>Medallion (Plus livery, black, limo, paratransit)</td>
<td>TLC</td>
<td>TLC</td>
<td>Non yellow medallion</td>
<td>✗</td>
</tr>
<tr>
<td>Singapore</td>
<td>Land Transport Authority</td>
<td>Taxi</td>
<td>LTA</td>
<td>LTA</td>
<td>LTA</td>
<td>✗</td>
</tr>
<tr>
<td>Ireland, Dublin</td>
<td>Commission for Taxi Regulation</td>
<td>Taxi Hackney</td>
<td>CTR</td>
<td>CTR</td>
<td>CTR</td>
<td>✗</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>Transport Department</td>
<td>Urban Taxis New Territories Taxis Lantau Taxis</td>
<td>TD</td>
<td>TD</td>
<td>TD</td>
<td>✗</td>
</tr>
<tr>
<td>Australia, New South Wales</td>
<td>NSW Department for Transport</td>
<td>Taxis (divided by area networks)</td>
<td>DfT</td>
<td>DfT</td>
<td>Area Network</td>
<td>✗</td>
</tr>
<tr>
<td>Indonesia, Jakarta</td>
<td>Kepolisian Negara Republik Indonesia (Polri)</td>
<td>Lower Premium</td>
<td>SIM</td>
<td>Samsat</td>
<td>Samsat</td>
<td>✗</td>
</tr>
<tr>
<td>Thailand, Bangkok</td>
<td>Department of Land Transport Bureau of Standards, registration and car tax.</td>
<td>Meter Non Meter 6 classes of taxi</td>
<td>DLT</td>
<td>Bureau of Standards, registration and car tax</td>
<td>DLT</td>
<td>✗</td>
</tr>
</tbody>
</table>
### Table 3.2: Comparison of Driver Requirements - Three Examples

<table>
<thead>
<tr>
<th>SINGAPORE</th>
<th>LONDON</th>
<th>NEW YORK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Must be 30 -73* years old.</td>
<td>Aged over 21 years.</td>
<td>Aged at least 19 years old.</td>
</tr>
<tr>
<td>(*Additional medical required for those aged 70-73 years)</td>
<td>Criminal record check - enhanced disclosure from the Criminal Records Bureau.</td>
<td>Fitness certified by a doctor licensed by NYS.</td>
</tr>
<tr>
<td>Singapore Citizen</td>
<td>Driving licence check for penalty points with DVLA.</td>
<td>Pass drug test.</td>
</tr>
<tr>
<td>Possess a valid class 3/3A driving license.</td>
<td>Medical fitness - Medical examination required to prove fitness at DVLA Group 2 standards.</td>
<td>Fingerprinting.</td>
</tr>
<tr>
<td>At least 1 year driving experience.</td>
<td>English language ability - spoken and written.</td>
<td>Speak and Understand English.</td>
</tr>
<tr>
<td>Pass English test - basic speaking, reading and writing.</td>
<td>Knowledge Test - on average it takes 3 years to study for this test.</td>
<td>Familiar with New York key locations and road rules/regulations - pass test.</td>
</tr>
<tr>
<td>Clean driving record.</td>
<td>Pass Driving Standards Agency Taxi driving test.</td>
<td>Agree to licensing requirements and</td>
</tr>
<tr>
<td>Undertake training at Singapore Taxi Academy.</td>
<td>Wheelchair Training.</td>
<td>Defensive Driving Course passed.</td>
</tr>
<tr>
<td>Pass end of training exam.</td>
<td>Pay licensing fee.</td>
<td>Taxi accredited training scheme completed and tested.</td>
</tr>
<tr>
<td>Training refresher undertaken every 6 years.</td>
<td></td>
<td>Wheelchair Passenger Assistance Training.</td>
</tr>
<tr>
<td>Pay fee.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Table 3.3: Comparison of Vehicle Requirements - Three Examples

<table>
<thead>
<tr>
<th>Singapore</th>
<th>London</th>
<th>New York</th>
</tr>
</thead>
<tbody>
<tr>
<td>To obtain vehicle licence must be: Partnership/Company/Cooperation with track record (including funding), Well developed business strategy to provide &amp; maintain an adequate, safe &amp; efficient service.</td>
<td>Can be obtained by individuals or companies.</td>
<td>Can be obtained by individuals or companies.</td>
</tr>
<tr>
<td></td>
<td>Purpose built vehicle which meets conditions of fitness. (Detailed vehicle specifications set out dimensions and vehicle requirements.)</td>
<td>Comprehensive vehicle specifications set out standard for interior space, dimensions, vehicle type.</td>
</tr>
<tr>
<td></td>
<td>Wheelchair accessible.</td>
<td>Approved vehicle “hack-up” at TLC approved garage.</td>
</tr>
<tr>
<td></td>
<td>Must be tested at TFL centre.</td>
<td>Must be Yellow.</td>
</tr>
<tr>
<td></td>
<td>Must meet Euro3 emission standard.</td>
<td>Roof light.</td>
</tr>
<tr>
<td></td>
<td>Must have taxi meter and receipt printer fitted.</td>
<td>Must have approved taxi meter.</td>
</tr>
</tbody>
</table>
3.3 International Benchmarking

A key indicator of taxi provision is to consider per capita provision. This provides an overview of supply in a given area. Figure 3.2 compares per capita provision in a number of key global cities. This indicates that the Greater Kuala Lumpur/Klang Valley region has a high level of taxi provision in relation to other global cities when considering the absolute number of vehicles. The majority (62%) of these vehicles are in licensed in Kuala Lumpur and while they can operate across the region, demands are likely to focus them on the city centre.

The number of vehicles itself is not always an exact indicator of the supply of taxi services because in some cities (for example New York and Sydney) vehicles may be double or triple shifted therefore the vehicles are constantly working. In other areas taxis may only operate for several hours a day as each driver operates their own vehicle. As a result a number of further indicators have been considered.

Taxis as a proportion of total registered vehicles by recent statistics from Ministry of Transport are as shown in Figure 3.3. There are over 7 million vehicles registered in Kuala Lumpur and Selangor of which licensed taxis represent 0.4% of the vehicles registered in Kuala Lumpur and Selangor.

### Table 3.4: International Comparison: Monitoring and Enforcement

<table>
<thead>
<tr>
<th>Country</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malaysia (KL)</td>
<td>Driver card can’t be renewed if outstanding police enforcement action.</td>
</tr>
<tr>
<td></td>
<td>SPAD enforcement officers.</td>
</tr>
<tr>
<td>England (London)</td>
<td>Self Enforcement via trade reporting, Enforcement Officers, Metropolitan Police</td>
</tr>
<tr>
<td></td>
<td>Various license penalty points enforcement systems and disciplinary hearings to revoke licenses if rules broken or driving offences committed - database</td>
</tr>
<tr>
<td></td>
<td>Annual vehicle testing</td>
</tr>
<tr>
<td>England (Outside London)</td>
<td>Self Enforcement via trade reporting, Enforcement Officers, Local Police</td>
</tr>
<tr>
<td></td>
<td>Various license penalty points enforcement systems and disciplinary hearings to revoke licenses if rules broken or driving offences committed.</td>
</tr>
<tr>
<td></td>
<td>Annual vehicle testing</td>
</tr>
<tr>
<td>USA, New York</td>
<td>Driver database</td>
</tr>
<tr>
<td></td>
<td>Vocational license fines and revocation enforcement system.</td>
</tr>
<tr>
<td></td>
<td>Police and enforcement officers – regular, covert and spotcheck.</td>
</tr>
<tr>
<td></td>
<td>Vehicle testing three times annually – emissions, safety, condition and quality against standards.</td>
</tr>
<tr>
<td>Singapore</td>
<td>6 monthly vehicle inspections</td>
</tr>
<tr>
<td></td>
<td>Vocational license points enforcement system</td>
</tr>
<tr>
<td></td>
<td>Service level agreements and monitoring</td>
</tr>
<tr>
<td>Ireland, Dublin</td>
<td>Service level agreements and monitoring</td>
</tr>
<tr>
<td></td>
<td>Driver database</td>
</tr>
<tr>
<td></td>
<td>Guards and enforcement officers.</td>
</tr>
<tr>
<td>Australia, New South Wales</td>
<td>Service level agreements and monitoring</td>
</tr>
<tr>
<td></td>
<td>Testing regime.</td>
</tr>
<tr>
<td>Indonesia, Jakarta</td>
<td>Annual emission test, physical safety check,</td>
</tr>
<tr>
<td></td>
<td>Enforcement framework including written warning; payment of fines; license suspension and / or revocation of license.</td>
</tr>
</tbody>
</table>
Chapter 3: Taxi Transformation Plan

The price of a typical 3 km trip in a regular or budget class vehicle has been assessed in a number of global cities. As would be expected the prices showed significant variation when converted to US dollars to allow direct comparison. Figure 3.4 shows the relationship between fares and GDP per capita and highlights fares in Vietnam are much higher than the other locations when considered in terms of GDP per capita. Fares have also been investigated in terms of the perceived quality of the service in a number of locations and the results are shown on Figure 3.5. Quality is not the only influence on price and other factors are significant in influencing taxi fares. The chart indicates the quality in the Greater Kuala Lumpur/Klang Valley region could increase slightly particularly if higher fares were to be justified.

It is clear that in the international context taxis fulfill differing roles in each of the cities considered and the information available regarding provision and the level of usage is inconsistent. This makes international experience difficult to transfer, though there are key international lessons which can be applied to the taxi industry in Malaysia and the Greater Kuala Lumpur/Klang Valley region.
3.4 The Future Role Of Taxis

Taxis have a specific role to play in a fully integrated land public transport system. They are able to provide services in situations where regular land public transport (bus, rail) is not available, for example in outlying areas, or outside its usual hours of operation such as late evenings. It is important that taxis are seen to complement and reinforce public transport services rather than compete with them. The TTP will seek to ensure that the role of taxis is part of an integrated transport network and will help achieve the National Vision 2020 and 1Malaysia.

In Greater Kuala Lumpur/Klang Valley taxis do not currently have a clearly defined role within the public transport system. Taxis are a primary part of the land public transport network and ply for hire across the city, undertaking the principal public transport role in areas that are not served by rail or bus. In this way they are providing a basic public service ensuring the accessibility of people to jobs, services and facilities.

As land public transport improvements are introduced via the Greater Kuala Lumpur/Klang Valley Master Plan, the role of taxis will be required to evolve. Key radial corridors into the city will be increasingly catered for by rail and BRT while bus will provide services on other minor radial corridors and feeder services to the key transit corridors. Taxis will need to integrate into this new land public transport system and adapt to fill the gaps within the system and to provide choice of service.

The Greater Kuala Lumpur/Klang Valley Master Plan has a target that 80% of the population of the region will be within 400 metres of a frequent bus service. With a fully functional integrated land public transport system in place across Kuala Lumpur it is likely the role of the taxi will evolve to meet the remaining markets. These markets (and the Master Plan objectives they meet) can be summarised as:

- Providing a core public transport service to those in outlying areas outside the catchment of core and feeder services; (accessibility and integration)
- Providing a local service where households have no car available and bus does not meet their needs (for example offering accessibility for the mobility impaired, the transportation of large packages or a local destination off the bus route); (accessibility)
- Providing a service outside conventional public transport operation hours; (safety)
- A high quality door to door service as a mode of choice for city centre trips where cost is not a deciding factor; (connectivity)
- Providing access for other land public transport modes (accessibility)
- Providing choice for those who cannot use conventional land public transport due to physical/mental disability (equality of opportunity)
Chapter 3: Taxi Transformation Plan

It is clear that taxis will be required to provide for distinct markets. There will be a need to retain low cost local services in order to meet local accessibility and transit needs particularly for low income groups with no access to a private vehicle. There is also a need to meet the needs of the wider region as part of the integrated Master Plan.

The TTP aims to meet the needs of all markets and address the identified issues across the industry, driving up quality in the sector while ensuring public and driver safety, service reliability and availability, comfort and convenience and accessibility. The process for the development of the plan is highlighted on Figure 3.6.

Figure 3.6: Process for the Taxi Plan Development

3.5 Where Do We Want To Be-For The Public

In order to provide a real choice for customers there is a need to raise the quality of services, public confidence in the industry and satisfaction levels. In line with bus and rail services there is a need for:

- Reliability
- Convenience
- Accessibility and connectivity
- Comfort
- Integration with other services
- Informed and empowered travellers
- Appropriate and understandable fares
- Quality of service

The public concerns highlighted in Section 2.13 show the key areas which need addressing in order for taxi services in Greater Kuala Lumpur/Klang Valley to be considered a quality service and be recognised as a professional and integrated part of the land public transport system. In addition to these concerns, the likely evolution of the role of the taxi means that the current issues regarding telephone booking and cherry-picking of fares and locations need to be addressed.

Currently the Greater Kuala Lumpur/Klang Valley region has only a small proportion of elderly residents. The Kuala Lumpur City Plan (April 2011) states only 4% of the cities residents are 65 years and above while those with disabilities account for just 1.13% of the City’s population. Though these numbers are small, as the economy grows and standards of living increase, these figures are likely to rise. The numbers of people requiring accessible vehicles currently is small but consideration should be made of likely future trends. There is a need to provide a recognisable taxi service which provides accessibility for all.
3.6 Where Do We Want To Be- For The Industry

The taxi industry provides an essential service for the ‘rakyat’ and as such it is essential to ensure the long term viability of the sector and to allow it to evolve as part of the Master Plan. However, the quality standard of other land public transport options in Greater Kuala Lumpur is improving and will continue to do so under the Master Plan. In order to play its part and be a respected part of the future integrated transport system the taxi industry must also continue to raise its quality standards. The challenge for the industry will be to ensure that quality is improved while ensuring the benefits to the industry exceed costs. This means it is important to ensure that drivers are receiving a fair return and will continue to do so under any new operating model in order to ensure quality standards do not fall.

In line with the other public transport sectors it is important that drivers are trained and properly equipped to undertake their role to a standard expected by the public. A current identified issue is that taxi drivers undertake little or no training and as a result the quality of service is varied, inconsistent and not seen as an attractive profession thereby further reducing service quality.

In summary for the industry we need to:

• Achieve a balance in the levels of supply and demand to allow a fare return to drivers with no disbenefit to the travelling public
• Trained drivers who act as ambassadors of the area
• Safe vehicles and drivers which meet passenger expectations

3.7 What Does SPAD Need To Do To Get There

The public requirements and industry standards drive the measures SPAD will need to put in place in terms of licensing requirements and operational standards. In order to work towards the public and industry requirements SPAD need to address the following issues:

• Increase the quality of service and public confidence through a review of licensing requirements and communication of changes to the public
• Provision of a recognisable fit for purpose taxi service and suitable vehicles
• A structure for fare setting with a requirement to use the meter
• Clear and efficient licensing processes which allow issue identification and continual improvement
• Improve the safety of customers, drivers and operators
• Be an effective organisation capable of delivering a good consistent service to operators, drivers and the public
• Be accountable and transparent in its processes

3.8 Summary

As a result of the public, industry and SPAD requirements discussed within the previous section a vision for future taxi services has been defined along with a series of core objectives.
Future Vision

Taxis will be a recognisable part of an integrated Greater Kuala Lumpur public transport system. They will provide a quality and professional service across the region that offers a real choice for users and become a respected brand internationally in terms of service levels and quality.

Key Conclusions

International experience shows quality regulation of vehicles and drivers is common, numerical limitation of licences is not.

Provision of taxis per capita is relatively high in Greater Kuala Lumpur/Klang Valley compared to other cities.

Key lessons can be learnt from international experience.

Role of taxis is likely to evolve.

Public requirements and Industry capabilities will drive the route SPAD needs to take with licensing processes.

Strategic Objectives

- To develop and improve the regulatory framework for the taxi industry;
- To enhance vehicle standards and drive up the quality of the fleet;
- To enhance driving standards, driver health and customer service;
- To promote the integration of taxi services into the wider public transport system with a recognisable brand;
- To facilitate access to high quality taxi services by all users,
- To partner and engage with stakeholders to help achieve strategic vision; and
- To measure and improve individual and industry performance through performance management framework and effective enforcement.
4 DEVELOPING THE TAXI TRANSFORMATION PLAN
4 DEVELOPING THE TAXI TRANSFORMATION PLAN

4.1 Introduction

The vision and strategic objectives developed in Chapter 3 as a result of the analysis carried out at Chapter 2 have resulted in the identification of a number of interventions and policy priorities. This section of the report discusses the actions and interventions that will be required in order to work towards and achieve each of the objectives.

4.2 Land Public Transport Master Plan Development

The individual actions and policy priorities highlighted in the following sections have been developed in response to the existing industry issues and likely future operation of the taxi industry in the region. Figure 4.1 demonstrates the process for action identification. This identifies the issues and expectations of the public and the industry to develop a vision and objectives as identified in the previous chapter. From these the best practice has been identified and a series of initiatives determined which are outlined in this chapter and relate to:

- Regulatory Framework
- Vehicle Standards
- Driver Standards
- Integration and Branding
- Network Reliability and Congestion
- Partnership
- Performance Management

4.3 Initiative 1 - Regulatory Framework

4.3.1 Supply and Demand

The regulatory framework should seek to balance supply with demand for taxi services in order to ensure that movement and economic growth is not restrained and there is not over competition resulting in a reduction of quality. There is currently no barrier to market entry in the Greater Kuala Lumpur/Klang Valley region other than the purchase or rental costs associated with the vehicle. This along with the deficiencies in other modes of public transport has seen a level of taxi provision which is far higher than in the other cities considered as part of the international benchmarking exercise.

The lack of available data on current demand makes it difficult to identify a theoretical optimum level of supply. However the characteristics of the market, (deterioration of quality, general abundance of
vehicles and reluctance to use the meter) along with the benchmarking exercise suggest the market is beginning to become unbalanced and is actually over supplied. If this trend continues the market may fall further out of balance with a potential increase in congestion and environmental impacts in addition to further deteriorating quality of service. However in order to correct this we would not advocate controlling the number of vehicle licences or indeed removing licences to reduce the current number.

The TTP recommends a market led approach is adopted along with enhanced quality standards and tightened licensing requirements. Indeed this emphasis on quality regulation rather than numerical regulation is the World Bank’s favoured approach along with the method that is successfully employed in cities such as London and Dublin. The recommended quality improvements are set out under the further relevant objectives.

In order to inform future policy and to understand the evolving relationship between supply and demand it is recommended that regular data collection exercises should be introduced. These should take the form of surveys of household travel habits including taxi trips and surveys measuring demand including on street surveys of hiring activity and reporting from telephone operators on the demand for services.

4.3.2 Enhanced Industry Standards And Expectations

There is an existing charter which sets out how taxi drivers/operators are required to act/operate along with the levels of service that customers can expect. It is recommended that this charter must be enhanced and enforced in order to reduce the current levels of ‘cherry-picking’ documented by the public feedback in Chapter 2. In order to achieve this there must be a requirement to ensure that when at a rank the taxi must pick up the first passenger in a queue and be obliged to transport them to the destination specified regardless if this is a short fare or into a congested area. This will be a key message the drivers and operators will be required to sign up to as part of their licence agreement. Linked to this requirement must be effective enforcement, performance management and public and trade education, (see initiatives under other objectives). This is a key requirement for the London taxi industry and helps ensure the public have confidence in the industry.

4.3.3 Transition To Operator Based Licensing

SPAD are currently in the process of moving all individual taxi vehicle licences to operator licences. This process will be completed by the end of 2011. There will be an ongoing requirement for all those owning taxis to obtain a vehicle and an operator licence from 2012. In addition drivers must obtain their driver’s card as per the existing situation. There is currently a freeze on new operator licences until 2012 until the process is complete. In order to become an operator, individuals will be required to obtain two
vehicles. This additional requirement will form part of the required increase in quality restriction. It is anticipated the move to operator based licensing will facilitate greater accountability and assist SPAD in the monitoring of drivers and vehicles.

4.3.4 Fares and Fare Review Mechanism

The fare structure with a flag fee followed by increments for set time and distance is a universally accepted method of structuring a fare. It is recommended that the fare structure be maintained with some minor modifications to address current identified issues.

The public and operator feedback has highlighted an issue with telephone bookings and the reluctance of drivers to take these fares. One method of encouraging telephone bookings to be met is by increasing the booking fee associated with the fare. Currently this is set at RM3 and it is recommended that a series of public attitude surveys are undertaken to establish how far this fee could be increased without suppressing demand.

A review of taxi operating costs and revenues has been undertaken which indicates that drivers are currently receiving a return in line with average income, (see section 2.10). The last fare review was carried out in 2009 which resulted in a 35% increase but fares are not reviewed regularly.

It is preferable to review fares regularly in light of a number of factors including:

- Operating costs - changes in fares need to reflect the changes in the costs incurred to provide the service to avoid negatively impacting supply or quality.
- Affordability - ensuring fares are set at a level which will not significantly restrict demand.
- Driver revenue - the drivers/operators must be able to make a return in line with their level of effort in providing the service.

Ensuring fares increases are in line with these three elements helps ensure vehicles are maintained and drivers are not overworking which in turn helps ensure a quality service. An index has been developed based upon the model used by TfL in London. The index works by obtaining data from various sources to produce year-on-year percentage changes for a range of components. The costs per mile are identified each year and the percentage change applied to each element of the fare card. Individual drivers and operators will of course have varying operating costs differing depending on their operating characteristics. Therefore the taxi cost index does not claim to represent the absolute operating costs but looks at the percentage change in average costs between two points in time.

The index recommended includes:

- Maintenance (parts, service, maintenance and insurance)
- Finance (vehicle repayment or rental cost)
- Fuel cost (based on average mileage)
- Change in average earnings (to allow for driver wage increase in line with general increase across the population and also a measure of affordability)

Summary of Recommendations - Regulation

- Adopt market led approach with enhanced quality standards and tightened licensing requirements to balance the supply and demand
- Begin regular data collection on supply and demand in order to inform ongoing policy.
- Set out enhanced industry standards.
- Requirements to obtain operator licence in addition to current driver and vehicle licence.
- Adopt a framework to regularly and consistently review fares.
4.4 Initiative 2 - Vehicle Standards

4.4.1 New Vehicle Class

A third class of vehicle between the budget and executive classes would be introduced in order to encourage quality in the fleet. The vehicle will operate on its own fare structure and looks to address some of the requests of the industry and public, namely, GPS, Credit & debit facility, Radio communication, MPV vehicle, >80 cm luggage area, >20 cm leg room, >1.3m seat length, Airbag, Auto-transmission, disabled friendly (with modifications). The aim is that drivers/operators will be encouraged to register for the new vehicle when they replace their vehicle and quality in the fleet will be improved. A further fare class will be introduced to offset and incentivise the increased purchase/operation costs. The existing Budget and Executive classes will be maintained at this time though through the enhanced data collection recommended in Initiative 1, the demand for these services can be reassessed in the future. As the differentiation between the qualities of the fleet in each class reduces, there will be less clarity over the markets each class serves and potentially less need to maintain separate classes.

4.4.2 Age Limit

The Budget vehicle fleet is of variable quality. The current age limit is 10 years with 8% of the fleet over 8 years old and over 50% of the fleet 6 or 7 years old. In the next 2 years there is potential for the proportion of the fleet over 8 years to substantially increase. In order to raise quality the age limit for vehicles to be licensed as taxis must be reduced.

It is recommended that the age limit should be set at 8 years old as this will continue to allow vehicles to be purchased on 7 year finance schedules. This requirement should be brought in for all new vehicle licence applications. In addition to the removal of the older vehicles this may discourage the trade of 2nd hand taxis at 6-7 years of age.

It is recommended that a further method incentivise vehicle renewal prior to the age limit is to introduce a vehicle scrappage incentive in cooperation with the vehicle manufactures. This would encourage old vehicles to be traded in and fleet renewal would occur more quickly. A scrappage incentive will be investigated further with vehicle manufacturers.

The Executive fleet are currently all under 6 years old however as the fleet ages there is potential for quality to reduce. It is important to ensure that vehicle standards for the executive and new third class also specify an age limit of 8 years. If appropriate SPAD can choose to continue to license older vehicles under an “exceptions” policy which would incentivise drivers and operators to maintain their vehicles to the highest standards and if at 8 years the vehicle was of a sufficiently high standard it could continue to be licensed for periods of 6 months at a time. This type of policy works well in many United Kingdom provincial local authorities as well as New York and encourages high levels of vehicle maintenance.

4.4.3 Vehicle Standards/Specifications

The existing vehicle standards and specifications for Budget vehicles allow only three types of national vehicle to be used. The standards should be revised in order to ensure higher quality; more spacious vehicles can be used where appropriate particularly in the Budget class. It is also appropriate to define quality and safety standards the vehicles must meet. The vehicles would then be checked annually against the benchmark set to ensure they continue to meet vehicle specifications and safety and quality levels. Vehicle quality standards should include the following issues members of the public have raised as concerns:

- A requirement to maintain the vehicle interior including ensuring upholstery is clean and in good condition
- All external indentations be checked to ensure they do not compromise the integrity of the vehicle and be repaired within 3 months or prior to annual inspection if within 3 months
- Further requirements as SPAD requires and in consultation with trade representatives
An issue raised by the public and taxi trade is the unwillingness of drivers to respond to telephone bookings. Anecdotally it is understood this is due to the low proportion of vehicles attached to radio circuits meaning limited vehicles are able to respond and if they are not in the immediate area they cannot respond without incurring lost kilometres (dead mileage). The enhanced vehicle specifications for Budget vehicles should specify radio communication in order that bookings can be met and service levels improve.

These specifications along with the reduction in the vehicle age limit will help increase quality in the fleet and help control entry to the market to encourage a balance of supply and demand.

4.4.4 License Renewal

The duration of licensing and automatic renewal must be revised. Currently vehicles are licensed for up to an initial 7 years period if registered from new and then for a further 3 years. Best practice suggests that the maximum period a vehicle should be licensed for is a period of 3 years from first license. In addition renewal must be subject to a vehicle safety and quality inspection. SPAD should look to license a number of premises to carry out these safety inspections to ensure standards are maintained and applied in a consistent manner. TfL and the New York TLC both operate licensed vehicle testing stations to ensure checking quality and consistency.

4.5 Initiative 3 - Driver Standards

4.5.1 Driver Training and Testing

Currently drivers are required to meet few standards before they can obtain a driver card. In order to obtain a drivers card one simply takes a regular driving licence to JPJ and provided the applicant has 5 years experience then they are awarded a driver card upon payment of the fee of RM350. The international benchmarking exercise has revealed that this is not common practice with all benchmarked authorities requiring some element of testing and training requirements to be in place. The public feedback highlighted a number of driver concerns including a lack of customer service and lack of local knowledge.

In order to improve quality, training and testing regime should be implemented in order to improve driver quality standards. SPAD will work with a third party to set up a driver training scheme to cover the following core areas:

Summary of Recommendations - Vehicle Standards

- Reduce age limit from 10 to 8 years.
- Introduce comprehensive annual vehicle testing.
- Review budget vehicle specifications to include quality aspects and radio communication.
- Work with vehicle providers to investigate scrappage incentive.
- Introduce new class of vehicle to drive up quality.
- No automatic licence renewal and initial license reduce from 7 to 3 years.
• Knowledge of the local area and key demand generators
• Customer service
• Basic numeracy and literacy (English fluency test)
• Health, safety and security
• Rules and regulations
• First Aid

This could be implemented and operated directly by SPAD but the recommended approach would be to work with an existing training provider to develop an accredited course with suitable content and delivery methods. This would ensure a consistent approach to training. This is the approach adopted in London, New York and Singapore. Once the training scheme has been developed all new applicants for a driver card must be required to successfully complete the training scheme and to undergo a test to ensure they have understood the content of the training. SPAD will need to input resources to develop the training programme with their chosen local provider and provide initial subsidy. International experience suggests it would be reasonable to expect new applicants to part contribute to the cost of the training. In order to drive up quality more rapidly the training programme can be rolled out to existing drivers. The resources required to undertake training with all drivers is likely to be prohibitive therefore the recommendation would be for existing drivers to undertake training if they are reported, receive complaints or are found to have received any law enforcement. The licensing process must be reviewed in order to implement this requirement to attend mandatory training.

It is further recommended that a comprehensive medical process be introduced in line with the findings of the international best practice. A medical assessment should be obligatory for all drivers, incorporating not only physical but psychological assessments to ensure the applicant is fit to practice as a taxi driver. A certificate would be provided which would need to be presented as part of the first driver licence application process and also when renewing the licenses. This would certify that the applicant was fit to work as a taxi driver in the view of a qualified doctor. The licensing requirements would need to be updated to ensure a driver is obliged to notify the licensing body should their ability to work change. A medical examination is a common requirement of the licensing process in many parts of the world.

4.5.2 Enforcing Existing Driver Requirements

Under the current licensing system drivers are required to meet a number of obligations as set out in the charter displayed in taxi vehicles. These indicate that a driver should always provide a good service, wear reasonable dress, charge according to the meter and must take the most direct route. However the public feedback suggests that some drivers can be reckless, rude, overcharge, not use the meter, and lack knowledge about key destinations and roads. Enforcing against these existing requirements could ensure an improvement in standards. Enforcement of moving vehicles must be carried out via the police but SPAD enforcement officers must start to carry out regular spot checks of vehicles at taxi stands to ensure standards are being met. It is further recommended that customer complaints are regularly monitored and reviewed to identify persistent vehicle or driver deficiencies. Spot checking in addition to regular scheduled enforcement activities is a common way to ensure compliance with standards in London and across the United Kingdom.

4.5.3 Duration of Driver License and Automatic Renewal

Taxi driver cards are currently issued for a period of a year following which they can be automatically renewed annually on an ongoing basis on payment of the appropriate fee. At renewal there is a check of the system to ensure the driver has no criminal convictions outstanding but there is no cross checking to ensure the driver has no outstanding complaints or issues. Quality can be improved through the abolition of automatic renewals and the introduction of cross checking at license renewal. Cross checking should take place with the central driver database (see Initiative 7) as well as law enforcement agencies. The level of positive and negative feedback relating
to a driver should be considered during the renewal process. Once drivers reach standard retirement age it is additionally recommended that they undergo an annual medical check to ensure they remain fit to drive a taxi.

Summary of Recommendations - Driver Standards
- Introduce mandatory training as requirement of new license.
- Encourage retrospective training.
- Introduce test as requirement of licensing.
- Abandon automatic license renewal and run checks on annual renewal.
- Driver medical test.

4.6 Initiative 4 - Integration And Branding

4.6.1 Branding

Within the existing vehicle classes and vehicle specifications, there is no coherent branding and the various classes and liveries currently can result in public confusion. Within the Budget class each operator is permitted to specify their own branding further confusing the public. Feedback from the trade representatives indicates that while company specific branding can give a competitive edge where there are only a handful of operators, the numbers involved in the Greater Kuala Lumpur/ Klang Valley region taxi market mean that they believe it offers no competitive advantage and may confuse members of the public, particularly tourists. Feedback also has been received indicating tour companies advise their clients not to use regular taxi services and only to use the clearly recognisable blue executive taxis or hotel services.

Given the level of tourism associated within the Greater Kuala Lumpur/Klang Valley region, it is important to ensure services and fare structures are clear and understandable for both the resident population and those visiting the area. If a consistent and quality service is delivered across the classes then such advice should not be given to tourists and use of taxis could increase as services will be clear. Once improvements have been implemented an information pack/leaflet aimed at tourists would be a useful way to educate this market on quality standards and service levels that can be expected.

Internationally, the cities in which taxis become an icon of the city are those in which branding is consistent and the vehicles are therefore easily recognisable. SPAD have an aspiration to create a recognisable iconic brand for Greater Kuala Lumpur/ Klang Valley. In order to achieve this, a common livery should be specified for each class which makes clear its role as a taxi but which also distinguishes the classes separately. This will improve public perception of the industry and encourage the public and tourism sector to view taxis as part of the integrated public transport system. It is recommended that no operators should be permitted to specify their own livery under the new requirements.

4.6.2 Centralised Customer Service Centre

The review of the current taxi sector at Chapter 2 identified that there is an inconsistent service in some areas and there are too many numbers for different operators. There was a customer desire to see a centralised dispatch/booking system which would send a vehicle wherever the customer required. SPAD have already taken these comments on board and are progressing with the establishment of a centralised customer service centre to deal with reservations and customer feedback. It is envisaged this will allow taxi reservations to be made 24-hours a day via the internet or a telephone hotline number. It is recommended that this is progressed through collaboration with existing operators and customer bookings are allocated to partner operators as is the case in Singapore. The
public desire to see a centralised booking centre is likely a result of the lack of taxis currently on radio circuits and the resultant low telephone booking success rate. In order to ensure the customer service centre is successful the proportion of taxis on radio circuits needs to be significantly increased.

In addition to the booking system, the centre will manage complaints and feedback. The review of the industry in Chapter 2 highlighted that some complaints are passed straight to operators who deal with these internally. The complaints and feedback system will rely on all complaints being forwarded to the centre to allow detailed analysis of deficiencies in the market and identification of mitigation, (as well as allowing the commendation of outstanding drivers receiving positive feedback). SPAD must work with all operators to ensure a common process is developed and complaints are forwarded to the central system.

In order to be successful, it is crucial that the public are made aware of the centralised customer service centre for booking and feedback/complaints. A wide ranging marketing campaign must be delivered as the system goes live to include, radio, leaflet, online and in taxi marketing. The marketing campaign should set out the feedback system in addition to booking information and make clear the process which will be followed once feedback is received.

4.6.3 Branding- 1Malaysia Quality Brand

A quality brand that already proposed would be applicable to the new vehicle class. In order to achieve this quality recognition drivers would be required to be trained and accredited and linked to the new integrated customer service centre. This would ensure customers are able to obtain vehicles wherever they require them and for drivers they are able to obtain work without the level of dead mileage currently reported. Customers would also be assured that they receive a trained driver and if the service did not meet expectations then their complaint would be handled by the service centre quickly, efficiently and transparently and that they would be kept informed of the resulting action taken. In order to ensure this brand is well received SPAD must ensure sufficient vehicles and operators register with the system.

In order to drive up quality across the fleet including the executive and budget classes it is recommended that the opportunity to voluntarily upgrade to the 1Malaysia quality brand (through training, vehicle quality and registration with the central service centre) is opened up to drivers and operators within the budget and executive fleets.

Summary of Recommendations - Integration and Branding

- Introduce mandatory branding to encourage understanding of the 3 taxi classes
- Introduction of 1Malaysia quality brand
- Introduce central booking and complaints centre.

4.7 Initiative 5 - Network, Reliability And Congestion

4.7.1 Priority Infrastructure and Use of Bus Lanes

Both the public and industry raised congestion as a key issue for taxis. Several key radial routes were highlighted as major concerns for congestion in the city centre, (see Chapter 2.12). One way to improve reliability of services and journey times through these congested areas is to allow taxis to use bus lanes where these exist and to ensure the design of new at grade bus lanes or priority infrastructure also allows for taxis. Allowing taxis to use this priority infrastructure helps ensure the public see taxis as part of an integrated public transport system. Taxis are permitted to use many of the bus lanes in London (the exceptions tend to be contra-flow facilities) which helps them avoid key congestion hotspots. In order for priority lanes
to be effective they must be self enforcing through kerbing or properly enforced to ensure they are not abused by private vehicles. With the current variety of taxi liveries this may be difficult to operate and enforce. The BTP examines the issue of bus priority measures and their enforcement.

4.7.2
Taxi Stand Provision

The review of existing taxi provision at Section 2 has indicated that taxi stand provision in the Greater Kuala Lumpur/Klang Valley region is inconsistent. Stands are provided in different ways at different locations and there is no central information bank on stand location, capacity and type. Some stands are marshalled, some require drivers or passengers to pay an additional fee, others are privately run or informal stands appear in areas of emerging demand. This lack of consistency combined with the taxi trade’s estimate of only 40% of km travelled being fare paying suggests that taxi drivers circulate looking for passengers rather than travelling to a stand to wait for passengers. The provision of more stands in the correct locations, in or adjacent to key demand generators will:

- Help reduce circulation and drivers km travelled per day
- Provide the public with locations they know they can safely obtain a taxi
- Eliminate/reduce taxis stopping or waiting on key routes causing an obstruction - helping to reduce traffic congestion and ease traffic flow

Taxi stands need to be conveniently located in areas of demand such as local shopping centres, major terminals, the new stations associated with the MRT lines identified by the URDP, local interchanges and other key locations such as leisure or tourism sites. In order to encourage both taxis and passengers to utilise the stands rather than attempting to flag vehicles on the street they must include a covered, safe waiting area and not require an additional customer charge to use the stand. SPAD will take the following actions in relation to taxi stand provision:

- Review current taxi stand provision and maintain a database
- Designate additional stands where gaps in provision are identified
- Ensure all major developments include a taxi stand within the design and ensure these are delivered during the building phase
- Long term work towards a common taxi stand approach to eliminate vouchers, supplements and other irregularities
- Promote the location and use of taxi stands

Summary of Recommendations - Access, Network and Congestion

- Facilitate use of at grade non segregated bus lanes
- Ensure enforcement of bus and taxi lanes
- Taxi stand provision - reduces dead mileage for drivers, provide safe waiting area for public
- Review the current Taxi stand provision
- Designate new taxi stands as required
- Ensure all new developments provide Taxi stands

4.8
Initiative 6 - Partnership

Although SPAD are responsible for all land public transport provision and vehicle licensing functions, other agencies retain some core functions which overlap with SPAD responsibilities. For example:

- Network maintenance is undertaken by various highway authorities across the Greater Kuala Lumpur/Klang Valley region, for example DBKL
- Taxi driver licensing process is operated by JPJ
- MoT projects to improve the highway network which may impact upon taxi operations or provision
In order to deliver many of the initiatives and policies detailed within this plan, there is a requirement for some cross agency cooperation and working. It is recommended that a stakeholder working group is set up to help the various agencies understand one another’s policies and points of view and to help develop shared objectives and working efficiencies. The group should meet quarterly in order to provide feedback to each agency and allow a forum for information exchange. The group needs to be attended by an appropriate level of employee ideally an employee with decision making privileges.

For example in order to allow taxis to utilise an existing bus lane there will be a requirement to work with the authority responsible for the highways in that location. The local authority may need to amend signage and review their enforcement actions.

Summary of Recommendations - Partnership

- Multi Agency cooperation - steering group

### 4.9 Initiative 7 - Performance Management And Enforcement

#### 4.9.1 Enforcement

There are currently a number of driver and vehicle requirements in place in the Greater Kuala Lumpur/Klang Valley region, for example, the existing driver charter. Enforcing against these existing requirements and ensuring those drivers that are not meeting industry standards have actions taken against them would encourage higher standards across the industry by immediately tackling any problem drivers or vehicles (as measured against the current requirements). As licence holders are currently accustomed to little enforcement action being taken, and there being little consequence to flouting regulations, an element of the fleet are encouraged to take the risk of operating outside regulations. For example, drivers may refuse to use the meter and charge a higher set fare to customers. This occurs because the potential gains to the driver exceed the perceived risk of being caught and the associate costs this would bring. In order to address this issue, enforcement activity should be commenced across the industry. This can consist of spot checks, covert surveillance, and periodic checks at key locations in addition to investigation of any customer feedback. SPAD will work to provide the public with information on how to report non compliance and how to ensure they obtain a minimum service level.

In order to further drive up quality across the fleet, it is important that as and when new requirements or licensing standards are set then these are effectively enforced. Without monitoring and enforcement the quality of the fleet will not increase and the potential benefits expected from the improved quality standards will not be accrued.

Enforcement activities must be carried out by SPAD enforcement officers although SPAD will also work with other agencies in order to facilitate joint

<table>
<thead>
<tr>
<th>Behaviours</th>
<th>Penalties</th>
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<tbody>
<tr>
<td>Overcharging by up to 10% of metered fare - 1 point</td>
<td>Accrue 6 points within 12 months - written warning letter issued.</td>
</tr>
<tr>
<td>Overcharging by over 10% of metered fare - 3 points</td>
<td>Accrue 9 points within 12 months - 2\textsuperscript{nd} written warning letter issued.</td>
</tr>
<tr>
<td>Speeding/reckless driving - 4 points</td>
<td>Accrue 15 points within 12 months - licence suspended for 1 month.</td>
</tr>
<tr>
<td>Refusal to take first passenger in taxi queue - 2 points</td>
<td></td>
</tr>
<tr>
<td>Refusal to transport passenger to specified destination - 4 points</td>
<td>Accrue 24 points within 12 months - licence revoked.</td>
</tr>
</tbody>
</table>
enforcement and economies of scale. SPAD will engage with the industry and public in order to facilitate enforcement and will act on all information which can be verified. At present there is limited resource dedicated to enforcement within SPAD. The level of resource required to enforce taxi legislation will be assessed and reviewed appropriately. In order to encourage compliance with regulations and provide a transparent and consistent approach to particular behaviours and consequences, it is advised a penalty points system will be set up. This penalty framework will set out each unacceptable action along with the consequence of each action to the driver, vehicle owner and/or operator. Penalty points systems are in operation successfully in Singapore and London and work to motivate all involved in the industry to behave professionally and appropriately. The framework will be developed in order to allocate a set number of points to each unacceptable action. It will additionally define the levels at which action is taken once points are accrued. An example of how this framework could operate is set out below.

Operator’s feedback detailed in Chapter 2.12 comments that they have no way to check the driving and employment history of drivers applying for jobs with them. They believe there is a problem of rogue drivers being sacked from one company and simply moving to another operator. Under the current licensing system there is no central database held in which to store details of driver, vehicle and operator licences. This means that performance tracking of individual drivers and operators is not possible. SPAD understand it is important to develop a database system in order to track driver and vehicle history, level of experience, complaints and enforcements and to motivate them to improve performance. SPAD will ensure the system once operational is capable of quickly and easily running checks on drivers applying for work with operators. This will ensure rouge drivers are removed from the industry and help in the drive to improve quality. SPAD will link the database to the proposed new customer feedback centre in order to make sure all reports of standards not being met are investigated and entered into the database where appropriate.

Together these actions will provide the public and service users in particular with confidence in the industry standards and that non compliance will be addressed appropriately, consistently and with due proportion.

4.9.2
Industry Performance Management

The proposals set out within this transformation plan represent a significant investment from SPAD in terms of time and resource. These proposals are set out based on the information available and it is advised further data is collected prior to beginning a programme of significant investment. In order to ensure SPAD as an organisation remains accountable for its actions and investments it is also important to ensure data is collected to measure the impact of the policies and interventions introduced once the transformation process commences. These data will help confirm that either the policies have been effective and provide value for money, or may indicate that a particular policy is not working as well as anticipated and requires amending. Without collecting data on the performance of the industry SPAD will be unable to make informed decisions.

SPAD will undertake to:

- Set a number of performance indicators in order to measure progress under each of the objectives
- Set quantitative and qualitative targets for each indicator
- Progress will be monitored against the targets annually
- Progress notes setting out the results of the monitoring exercise will be published along with any resulting amendment to the policies
- Targets will be reviewed every two years
In addition to internal progress and monitoring it is important that customer satisfaction is measured against performance indicators and targets. The indicators set will include:

- Satisfaction with service
- Proportion of telephone bookings met

Industry performance management reporting is undertaken across a range of global cities including Sydney, Dublin and Hong Kong where it is regularly reported and used in policy setting.

**Summary of Recommendations - Performance Management and Enforcement**

- Enforce existing regulations - quick win
- Enforcement officers - review of resource
- Public understanding and education
- Driver, Vehicle and Operator Database
- Industry performance measurement
- Penalty point system

**Key Conclusions**

- A number of regulatory changes are required in order to improve the operation of the taxi market.
- Improvements in vehicle and driver quality must be delivered.
- Quick wins are possible
- Enforcement of standards and regulations must be a priority
- Public education on expectations and customer rights required.
- Requirement to collect data on existing operations and monitor industry improvements.
5 PHASING AND DELIVERY
Chapter 3: Taxi Transformation Plan

5 PHASING AND DELIVERY

5.1 Introduction

Chapter 4 outlined the proposals in the TTP. In this chapter the ease of delivery of each proposal is considered. An indicative timescale is then considered in order to prioritise the delivery of each of the measures.

5.2 Ease Of Delivery

The proposals set out in the previous chapter have been categorised in relation to their impact and the level of influence or control SPAD has in the delivery of these policies. It is important to deliver those policies where SPAD retain control over delivery and the impact of the intervention is likely to be high as the benefits are likely to be significant in relation to costs. Although it could be tempting to concentrate on the measures where SPAD have influence it is recognised it will be important to work with other agencies to ensure high impact policies are progressed where SPAD does not control overall delivery. In addition it will also be important not to be seen to neglect those policies which may have a smaller or less immediate impact. These are often complementary measures which will help improve the effectiveness of other measures for delivery. Figure 5.1 details the assessment.

5.3 Costs And Benefits

As part of this TTP it has not been possible to carry out detailed cost benefit assessments against each indicative policy; however a broad assessment of the likely costs, benefits and issues has been prepared. SPAD should look to carry out more detailed cost benefit analysis or regulatory impact assessments before progressing in order to test the likely impact and affordability of the proposals. As there is overlap of policy measures between objectives the proposals are split into regulatory, driver, vehicle, enforcement and external proposals. Tables 5.1 - 5.5 set out the benefit assessment.

Figure 5.1: Impact/Benefit and SPAD Influence Categorisation

- High SPAD Influence Low Impact
  - Operator based licensing system
  - Customer service centre
  - 1 Malaysia quality brand
- High SPAD Influence High Impact
  - Fare review system
  - Balancing supply & demand
  - Enhancement of licensing standards
  - Enforcement of existing regulations
  - Driver Database
  - Penalty points framework
  - Industry performance monitoring
  - Vehicle standards
  - Vehicle age limit review
  - Driver training programme
  - Testing
  - Branding

- Low SPAD Influence Low Impact
  - Public education
  - Taxis to use bus lanes (low impact as currently there are not many)
- Low SPAD Influence High Impact
  - Multi agency stakeholder partnerships
  - Enforcement of existing regulations
  - Enforcement of bus lanes
  - Rank provision
Table 5.1: Regulatory Policy Interventions

<table>
<thead>
<tr>
<th>PROPOSAL</th>
<th>Likely Cost</th>
<th>Likely Benefit Short term</th>
<th>Likely Benefit Long term</th>
<th>Other issues for consideration</th>
<th>Success Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality Regulation to address supply/demand</td>
<td>Medium</td>
<td>Low</td>
<td>High</td>
<td>Regulatory change required. Long term process - do not expect immediate results.</td>
<td>Careful drafting of regulations and overarching regulatory framework.</td>
</tr>
<tr>
<td>Enhance Driver Charter - link to licensing framework</td>
<td>Low</td>
<td>Low</td>
<td>Medium</td>
<td>Will require change of driver licensing conditions. Charter will need reissuing to industry when it is brought in.</td>
<td>Enforcement and public education required in order to realise benefits.</td>
</tr>
<tr>
<td>Operator Based Licensing with service level agreements</td>
<td>Low</td>
<td>Low</td>
<td>Medium</td>
<td>Already underway - no additional resource required. Will require internal resource to monitor.</td>
<td>Well defined service level agreements.</td>
</tr>
<tr>
<td>Initial Fare Review</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Public survey required to identify willingness to pay. Errors in data or calculations may prevent accurate baseline being set.</td>
<td>Accurate, independent data required.</td>
</tr>
<tr>
<td>Fare structure regular update</td>
<td>Low</td>
<td>Medium</td>
<td>Medium</td>
<td>Once methodology has been developed index costs require annual/biannual update. Cost in additional meter calibration but can be combined with existing meter checks.</td>
<td>Ensure baseline assessment is accurate and index values are independently obtained wherever possible.</td>
</tr>
<tr>
<td>Vehicle license renewal increase frequency to 3 years once</td>
<td>Medium</td>
<td>Low</td>
<td>Medium</td>
<td>Increased licensing administration required to manage the more frequent process.</td>
<td>Automate cross checks with database to minimise administration where possible.</td>
</tr>
<tr>
<td>Suspend automatic driver card renewal in order to introduce further driver checking.</td>
<td>Medium</td>
<td>Low</td>
<td>Medium</td>
<td>Introducing checking as part of the renewal process will highlight any issues. Will require additional resource to manage. Unclear if JPJ could manage additional requirements.</td>
<td>Aim to maximise efficiencies by automating database checking.</td>
</tr>
<tr>
<td>1Malaysia accreditation brand</td>
<td>Accounted for elsewhere</td>
<td>Low</td>
<td>Medium</td>
<td>High profile launch advisable to highlight the brand and what it means. Some central administration required but accounted for under other initiatives. To increase impact, consider widening availability across classes.</td>
<td>Ensuring public can identify the value of the brand.</td>
</tr>
<tr>
<td>Develop driver, operator and vehicle database</td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
<td>Resource required to develop and operate database. Data checks will need running on request from partner operators. Requires linkages with other licensing systems.</td>
<td>Information can be obtained through current relicensing exercise therefore can be developed at little additional cost.</td>
</tr>
<tr>
<td>Introduce penalty points system to enforce against drivers</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>Development of penalty framework required backed by ongoing monitoring and enforcement of drivers, vehicles, operators. May require regulatory/legislative update to licensing conditions/agreements. Ongoing administration required by SPAD.</td>
<td>Continued enforcement will encourage future compliance.</td>
</tr>
</tbody>
</table>

Table 5.2: Driver Policy Interventions

<table>
<thead>
<tr>
<th>PROPOSAL</th>
<th>Likely Cost</th>
<th>Likely Benefit Short term</th>
<th>Likely Benefit Long term</th>
<th>Other issues for consideration</th>
<th>Success Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Driver Training Introduction for new applicants</td>
<td>High</td>
<td>Low</td>
<td>High</td>
<td>High initial subsidy required to develop programme. Partnership working with provider essential to develop fit for purpose course with official accreditation. Only requiring new drivers to complete would increase benefit payback time. Testing to confirm applicant understanding.</td>
<td>Learn what works and what doesn’t from international experience.</td>
</tr>
<tr>
<td>Driver Training for existing driver pool</td>
<td>High</td>
<td>Medium</td>
<td>High</td>
<td>Significant cost would be involved in training all existing drivers but potential benefits would be great. Potential to train existing drivers over an extended timescale. Administration resource required internally.</td>
<td>Do not try to implement too quickly.</td>
</tr>
<tr>
<td>Driver testing and medical</td>
<td>High</td>
<td>Low</td>
<td>Medium</td>
<td>Administration costs to SPAD. Cost to individual drivers. Will need to approve doctors to undertake the process or let a contract.</td>
<td>Ensure the testing process is consistent and properly monitored.</td>
</tr>
</tbody>
</table>
### Table 5.3: Vehicle Policy Interventions

<table>
<thead>
<tr>
<th>PROPOSAL</th>
<th>Likely Cost</th>
<th>Likely Benefit Short term</th>
<th>Likely Benefit Long term</th>
<th>Other issues for consideration</th>
<th>Success Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>• New Vehicle Class</td>
<td>Medium</td>
<td>Low</td>
<td>Medium</td>
<td>• Already underway due for launch quarter 3/2011. Will require new legislation set, fare schedule, public awareness campaign and launch. Longer term will require review of existing classes as and when quality differentiation reduces.</td>
<td>• Ensure it is attractive to operators to encourage take up.</td>
</tr>
<tr>
<td>• Revise Age Limit</td>
<td>Low</td>
<td>Medium</td>
<td>High</td>
<td>• Requires revision to vehicle specifications. May be significant cost to operators. Only effective when combined with regular testing regime. Exceptions policy may be introduced for high quality vehicles.</td>
<td>• Scrappage incentives from vehicle manufacturers likely to encourage acceptance but may require SPAD financial contribution.</td>
</tr>
<tr>
<td>• Revise Vehicle Specifications</td>
<td>Low</td>
<td>Medium</td>
<td>High</td>
<td>• Comprehensive review of specifications required to define standards and set out list of permitted vehicles. Long term renewal required</td>
<td>• Define quality standards in addition to regular dimensions.</td>
</tr>
<tr>
<td>• Radio/ Phone Circuit</td>
<td>Low</td>
<td>Low</td>
<td>Medium</td>
<td>• Cost to operators. Introduction to fleet would be gradual.</td>
<td>• Combine with update to vehicle specifications. Incentivise provision.</td>
</tr>
<tr>
<td>• Annual vehicle testing framework</td>
<td>High</td>
<td>Medium</td>
<td>High</td>
<td>• Testing framework will need developing. Vehicle testing centres and assessors will need implementing or approving. A contract could be let to ensure a company operate this on behalf of SPAD. Any contract would require monitoring.</td>
<td>• Ensure the testing process is consistent and properly monitored.</td>
</tr>
<tr>
<td>• New branding specifications - develop single liveries for each of the 3 classes.</td>
<td>Low</td>
<td>Medium</td>
<td>Medium</td>
<td>• Branding and livery guidelines could be developed internally. Cost to operators if requirement retrospective rather than only for new licenses. Important to develop consistent brand for other initiatives such as use of bus lanes.</td>
<td>• Ensure industry see the benefits of complying to ensure swift rebranding. Public education important step.</td>
</tr>
</tbody>
</table>

### Table 5.4: Enforcement Policy Interventions

<table>
<thead>
<tr>
<th>PROPOSAL</th>
<th>Likely Cost</th>
<th>Likely Benefit Short term</th>
<th>Likely Benefit Long term</th>
<th>Other issues for consideration</th>
<th>Success Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Enforcement Officers and spot checks</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>• Enforcement is important but will require resource. The resource will need to be reviewed as appropriate.</td>
<td>• Costs may be offset by increasing license application and renewal fees. Aim for cost neutral.</td>
</tr>
<tr>
<td>• Review of complaints from database</td>
<td>Low</td>
<td>Low</td>
<td>Medium</td>
<td>• Will allow identification of issues with limited resource requirement. Investigation resource required.</td>
<td>• Aim to automate alerts.</td>
</tr>
<tr>
<td>• Enforce existing regulations</td>
<td>Medium</td>
<td>High</td>
<td>High</td>
<td>• Enforcement resource required to carry out spot-checks, periodic checks and covert enforcement where necessary.</td>
<td>• Look to finance through licence fees. Education of public important.</td>
</tr>
<tr>
<td>• Industry performance monitoring and target setting</td>
<td>Low</td>
<td>Medium</td>
<td>High</td>
<td>• Low cost to set targets and indicators but annual monitoring and commissioning of surveys will be required along with progress monitoring - internal resource required to manage.</td>
<td>• Effective monitoring will allow policy to be reviewed as necessary.</td>
</tr>
</tbody>
</table>
Table 5.5: Network/External Policy Interventions

<table>
<thead>
<tr>
<th>PROPOSAL</th>
<th>Likely Cost</th>
<th>Likely Benefit Short term</th>
<th>Likely Benefit Long term</th>
<th>Other Issues for consideration</th>
<th>Success Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industry data collection</td>
<td>Low</td>
<td>High</td>
<td>High</td>
<td>Some data to be collected through relicensing. Surveys will be required. Results may change priorities.</td>
<td>Understand information and data required and draft surveys and data collection schedule accordingly.</td>
</tr>
<tr>
<td>Public Education and Marketing</td>
<td>Low</td>
<td>Low</td>
<td>Medium</td>
<td>Charter must be accepted by industry - consultation required. Will require long term marketing to align customer expectations and encourage feedback.</td>
<td>Target all audiences - particularly tourism market which is expected to expand with economic growth.</td>
</tr>
<tr>
<td>Central Customer Service Centre</td>
<td>Medium</td>
<td>Low</td>
<td>Medium</td>
<td>Could be cost intensive to set up and operate 24/7. Central administration required. Relies on drivers/operators having radio/telephone circuits in vehicles. Must link to central driver/vehicle database.</td>
<td>Need to ensure critical mass of operators/vehicles on board to ensure success. Need to ensure public know about the scheme and use it.</td>
</tr>
<tr>
<td>Investigate bus lane usage</td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
<td>Cost to update signage and possibly regulations/legislation (TRO equivalent). Any additional priority infrastructure would require funding.</td>
<td>Would only work if bus lanes are enforced and not used for parking. Would be easier to operate if taxis had consistent livery to aid in enforcement.</td>
</tr>
<tr>
<td>Carry out taxi stand review and develop appropriate policy</td>
<td>Low</td>
<td>Low</td>
<td>Medium</td>
<td>Would provide information to add to the evidence base to influence future policy.</td>
<td>Stand location must be promoted and standardisation encouraged.</td>
</tr>
<tr>
<td>Stakeholder partnership working groups</td>
<td>Low</td>
<td>Low</td>
<td>Medium</td>
<td>Low cost but benefits and potential working efficiencies worthwhile for SPAD and stakeholder organisations once established. Terms of reference for group would need to be developed.</td>
<td>Critical to ensure appropriate membership.</td>
</tr>
</tbody>
</table>

Table 5.6: Summary of Benefits

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Indicator</th>
<th>Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economic Competitiveness</td>
<td>• Access to Jobs</td>
<td>• The increased land public transport provision including taxi options will enhance accessibility and choice for workers to reach jobs.</td>
</tr>
<tr>
<td></td>
<td>• Access to International Links</td>
<td>• Provision of improved vehicles capable of transporting luggage.</td>
</tr>
<tr>
<td></td>
<td>• Reduce Journey Times</td>
<td>• Through improved integration with other modes.</td>
</tr>
<tr>
<td></td>
<td>• Improve Reliability</td>
<td>• Provision of priority infrastructure and off network taxi stands will assist in improving traffic flow and journey time reliability.</td>
</tr>
<tr>
<td>Access, Connectivity and Integration</td>
<td>• Improve accessibility</td>
<td>• Telephone booking service and increased radio/telephone circuits will increase access to services.</td>
</tr>
<tr>
<td></td>
<td>• Improved integration between modes</td>
<td>• Interchanges between taxi and other modes will be facilitated through provision of taxi stands at interchanges.</td>
</tr>
<tr>
<td>Efficiency</td>
<td>• Improved integration between Transport and Land Use Planning</td>
<td>• Taxi stand provision to be considered as part of all new major development applications.</td>
</tr>
<tr>
<td></td>
<td>• Journey Time Reliability</td>
<td>• Use of bus lanes will increase the reliability of taxi journeys</td>
</tr>
<tr>
<td></td>
<td>• Mode Share</td>
<td>• Improved standards will increase the mode share of taxi use</td>
</tr>
<tr>
<td></td>
<td>• Deliverability</td>
<td>• A deliverable plan will be established through detailed technical feasibility</td>
</tr>
<tr>
<td>Social Inclusion</td>
<td>• Providing access for all through better connectivity</td>
<td>• Increased land public transport supply will close the transit gaps allowing more people access to the system.</td>
</tr>
<tr>
<td>Safety and Security</td>
<td>• Providing improved safety and security for passengers</td>
<td>• Driver database and enhanced training to improve passenger safety and security.</td>
</tr>
<tr>
<td>Environment</td>
<td>• Reduce road accidents</td>
<td>• Driver training to include defensive driving elements. Encouraging a professional and trained industry.</td>
</tr>
<tr>
<td></td>
<td>• Improve air quality through reduction of circulating vehicles and oversupply</td>
<td>• Increased quality control likely to reduce increasing licence numbers thus contributing to air quality.</td>
</tr>
</tbody>
</table>
5.4 Phasing And Implementation

Based on the assessments carried out an indicative implementation timeframe is highlighted at Figure 5.2. This demonstrates which policies should be prioritised and which can be implemented at a later date. Interdependencies are highlighted.

This delivery plan will be supported by other elements of the Master Plan which are reported in the remaining Subsidiary Plans. These include:

- Urban Rail Development Plan (URDP)
- Bus Transformation Plan (BTP)
- Interchange and Integration Plan (IIP)
- Land Use Plan (LUP)
- Travel Demand Management Plan (TDMP)

Together these provide an integrated land public transport plan for the Greater Kuala Lumpur/Klang Valley region and are summarised in the overall Master Plan document. The plan will also identify the role of each of these measures in terms of proposed modal share targets which will be contained within the Master Plan.

![Figure 5.2: Taxi Transformation Measures](image-url)
5.5 Next Steps

Following publication of the Master Plan the next steps for the taxi proposals are as follows:

- Collect additional data in order to justify policy proposals
- Consultation on the Master Plan proposals
- Regulatory impact analysis and/or cost benefit analysis to identify impact of taxi proposals
- Data collection exercises to begin
- Drafting of new standards, licensing policy and performance targets
- Implementation of policy
- Gradual adoption of new standards until older vehicles phased out
- Monitoring and review of progress at key decision points

Key Conclusion

The TTP offers a combination of long and short term interventions in order to drive up the quality of drivers, vehicles and legislative processes while offering real benefits to the travelling public.

Overall the Master Plan will assist the economic performance of the region.
6 SUMMARY
Chapter 3: Taxi Transformation Plan

6 SUMMARY

SPAD has developed the National Land Public Transport Master Plan to set out the vision and direction for land public transport in Malaysia. The purpose is to develop a long term programme to address the current deterioration in LPT with plans to execute high impact, effective delivery initiatives for 20-years sustainable quality land public transport service for the nation.

The National Land Public Transport Master Plan sets the building blocks for National Land Public Transport Policy and provides a Planning Toolkit for the development of Master Plan. The first of the Regional Master Plans developed by SPAD is for the Greater Kuala Lumpur/Klang Valley region. This document provides the subsidiary plan relating to Taxis. The region is of key economic importance for Malaysia as a whole.

In order to aid the development of the Master Plan, a series of Guiding Principles have been developed examining issues related to accessibility, capacity, social inclusion and the environment.

A range of policies relating to taxi licensing standards and operations have been reviewed.

Population will continue to grow in the region increasing the demand to travel. Employment intensification is proposed in key centres, particularly the centre of Kuala Lumpur. The employment areas will need good accessibility to maintain the economic status of the region.

The increase in population and employment will increase travel demands. This will put further pressure on the highway network with resulting congestion and unreliable journey times unless public transport capacity and performance improves so as to reduce traffic levels. Land public transport accessibility will be improved along the LRT extension corridors and the new MRT corridors identified in the URDP but overall accessibility will worsen unless additional land public transport supply is provided. Taxi provision is required to fit in around the alternative modes.

The Master Plan has set out definitions for developing the hierarchies of transport corridors based on primary, secondary, feeder and local/district. The assessment process considers the role of each mode such that the growing travel demand can be met by the appropriate mode. The role of taxi is to

- Providing a core public transport service to those in outlying areas outside the catchment of core and feeder services; (accessibility and integration)
- Providing a local service where households have no car available and bus does not meet their needs (for example offering accessibility for the mobility impaired, the transportation of large packages or a local destination off the bus route); (accessibility)
- Providing a service outside conventional public transport operation hours; (safety)
- A high quality door to door service as a mode of choice for city centre trips where cost is not a deciding factor; (choice)
- Providing access/egress journeys for other land public transport modes.
- Providing choice for those who cannot use conventional land public transport due to physical/mental disability.
### Table 6.1: Summary of the Greater Kuala Lumpur/ Klang Valley Master Plan against the Guiding Principles

<table>
<thead>
<tr>
<th>Guiding Principle</th>
<th>Review of Master Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consider the planning, integration &amp; co-ordination of all land public transport modes</td>
<td>The approach adopted has developed a corridor based approach to integrating the land public transport modes. These elements are addressed further in the other Subsidiary Plans.</td>
</tr>
<tr>
<td>Define modal share targets</td>
<td>Mode Share targets to be addressed in the main Master Plan document. The provision of the bus service improvements will form a key building block in achieving these</td>
</tr>
<tr>
<td>Define complementary policies to allow the land public transport model share to achieve the targets</td>
<td>Integration with Land Use &amp; Demand Management Policies addressed through the subsidiary Plans to allow integration of the Master Plan with Land Use. Stakeholder engagement process is developing those linkages such as between the URDP and City Plan and Structure Plan</td>
</tr>
<tr>
<td>Allow land public transport to be socially inclusive to be the mode of choice for all users</td>
<td>High quality of taxi service will increase the demand for land public transport usage. Good design of the bus service networks and hierarchies will allow access for all users</td>
</tr>
<tr>
<td>Provide for increased accessibility &amp; connectivity</td>
<td>The improved taxi quality will increase accessibility and connectivity to and between services</td>
</tr>
<tr>
<td>Take account of the hierarchy of centres; primary centres in particular should be served by rail, where possible to encourage modal transfer</td>
<td>The provision of taxi network, reliability and congestion issue arises has taken account of the key centres within the region</td>
</tr>
<tr>
<td>Provide capacity to meet future demands efficiently and reliably to allow the region to grow economically</td>
<td>The TTP will increase accessibility &amp; reduce travel times thus providing benefits to the local economy</td>
</tr>
<tr>
<td>Provide additional capacity to serve central Kuala Lumpur given its economic importance to the country</td>
<td>The taxi services will complement the improvement of rail network includes MRT lines to serve the city centre which will increase accessibility and reduce travel times thus providing benefits to the local economy.</td>
</tr>
<tr>
<td>Be based on a process of engagement with Stakeholders</td>
<td>This process is on-going through the Master Plan development and will continue through implementation and review</td>
</tr>
<tr>
<td>Take account of previous studies and plans where appropriate</td>
<td>The development of the Master Plan has reviewed previous studies and taken account of the needs of the local authority development plans</td>
</tr>
<tr>
<td>Seek to provide environmental benefits to the region in terms of noise and air quality</td>
<td>The improvements to the bus network will encourage modal transfer which will reduce car traffic levels allowing improvements to the environment</td>
</tr>
<tr>
<td>Corridors should be served according to the appropriate mode to meet demands</td>
<td>This is achieved through the Master Plan development process</td>
</tr>
</tbody>
</table>
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4. Summary 383

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1 EXISTING LAND USE POLICY AND PLANNING PROCESS
1 Existing Land Use Policy and Planning Process

1.1 Introduction

Chapter two provides an outline of the key considerations in the development of the LUP and it summarises the existing land use policy framework and planning process in Greater Kuala Lumpur/Klang Valley.

The approach of developing the LUP is based on the following:

- Review of existing policy framework and planning process
- Identify policy levers and develop mechanism to influence land use pattern

The LUP is aimed to develop mechanisms to influence land use policies and planning process in the Greater Kuala Lumpur/Klang Valley region to favour public transport provision and performance in support of the overall Greater Kuala Lumpur/Klang Valley Master Plan objectives. This in turn will better integrate public transport system with pace and shape of Greater Kuala Lumpur/Klang Valley land use development, serving both existing travel demand and upcoming major new developments.

1.2 Key Considerations In Master Plan Development

The function and role of SPAD are defined in the SPAD Act 2010 (Act 714). Under the current legislation, SPAD is responsible for the development and delivery of Greater Kuala Lumpur/Klang Valley Master Plan but has no direct influence on the land use planning process. However, recognising the land use development patterns drive travel demand both for passenger and goods, the Greater Kuala Lumpur/Klang Valley Master Plan seeks to consider and integrate land use policies with the Greater Kuala Lumpur/Klang Valley Master Plan initiatives. A pragmatic and practical framework will enable SPAD to work with states and local authorities to create incentives or disincentives to constructively intervene in the planning process. This is almost imperative for the holistic development of the Greater Kuala Lumpur/Klang Valley to encourage sustainable mode shift to land public transport.
The review of existing land use policy and planning process would focus on Kuala Lumpur, Selangor and Putrajaya. Negeri Sembilan is considered outside the defined region hence the relevant land use policy and process are not reviewed. As part of the Greater Kuala Lumpur/Klang Valley Master Plan study process, stakeholders’ engagement with DBKL, UPEN Selangor, JPBD Selangor and Perbadanan Putrajaya has been carried out to inform and understand their respective land use policy and planning process.

1.2.1 Existing Land Use Policy

Currently, there are three levels of authorities administering the land use planning matters, in accordance to the Town and Country Planning Act 1976:

- National Physical Planning Council (NPPC) at the Federal level has discretion in establishing Regional Planning Committees for the purpose of coordinating development involving more than one state.
- State government is given the responsibility to provide general land use planning policies within its boundary.
- Local authority is responsible for the planning and control of development activities in its area.

There is currently no formal arrangement of a Regional Planning Committee for the Greater Kuala Lumpur/Klang Valley region. It should be highlighted that, under current practice, a Regional Planning Committee is merely conferred consultative and advisory power to advise State and Local planning authorities within the region pertaining to development plans, but no direct involvement to implement and regulate land use planning.

The NPPC provides strategic policies and guidelines for the physical development and planning at federal and states level throughout Peninsular Malaysia. The Town and Country Planning Act 1976 requires the Selangor State Government to prepare a SSP to formulate policies and general proposals in respect of the development and use of land for areas; and local authorities to produce DLP providing detailed planning proposals.

In Federal Territories (i.e. Kuala Lumpur and Putrajaya) the local planning authority (i.e. DBKL or Perbadanan Putrajaya) is required to prepare both SSP and DLP in its planning area to guide the land use development and planning activities. The existing hierarchy of land use development plans in Malaysia is illustrated in Figure 1.1.

1.2.2 Existing Planning Process

Under the current development planning system, local authority is empowered to grant or refuse planning application within its boundary. In most cases the development control process would involve quantitative and qualitative technical assessment (for comments and recommendations) of the proposed development and its effect on the surrounding area to enable a subsequent decision making on the application. This is illustrated in Figure 1.2.
Dewan Bandaraya Kuala Lumpur

The Federal Territory of Kuala Lumpur’s land use planning is regulated by the Federal Territory (Planning) Act 1982. Proposals for comprehensive and large scale development, change to land use and increasing density as well as application for the use of government land will be considered by Urban Planning Committee I (chaired by the Mayor), with the Development Order (DO) issued by the Mayor.

The Urban Planning Committee II looks into application for development of shop houses, detached houses, mosques, industrial buildings. The process is similar but the DO will be issued by the Director General of DBKL.

Currently DBKL applies a land use zoning map to regulate land use and planning standards such as plot ratio, density and plinth area to control the development type and size. The current land use and plot ratio baseline was based on the 1970 Comprehensive Development Plan. Any changes to plot ratio, land use and density that result in higher land values, developers are required to pay development charges as a portion of the enhanced value such as:

- 30% of difference in land value for increase in plot ratio from baseline to the suggested plot ratio in KLCP 2020
- 50% of difference in land value for increase in plot ratio beyond the suggested plot ratio in KLCP 2020.

In addition DBKL has included a penalty for inadequate car park provision (i.e. RM60,000 per parking space). For developments within 250 meters from a rail station up to 30% of car park requirement can be exempted for RM 20,000 per space and for developments within 251-400 meter of a rail station, up to 15% of car park requirement can be exempted for RM20,000 per space.

KLCP 2020 has identified Transit Planning Zone (TPZ) to areas within 400m of a transit (LRT, KTM Komuter, Kuala Lumpur Monorail or BRT) station. The TPZ is a special zone where more intensified development will be encouraged (incentives such as higher density and plot ratio) to provide higher intensity of population and employment to support land public transport travel. The plan is aimed to encourage TOD by proposing incentives such as bonus of additional 0.5 plot ratio for development in the priority TPZ, i.e. within 250 meters from rail station.

State of Selangor

Land use zoning, plot ratio and density are managed by the respective local authorities. The development control process is broadly similar to DBKL where planning applications would be examined and assessed, then the scope of modifying and mitigating to be evaluated before a planning permission is rendered.

Similar to Kuala Lumpur, development charges levied for a change in plot ratio (between the baseline and approve plot ratio) have been introduced in Selangor with Majlis Bandaraya Petaling Jaya (MBPJ) pioneering the implementation in 2010. The valuation of increased land value will be conducted by external property valuer appointed by developers while MBPJ will undertake internal review of the valuation. For areas in other local authorities of Selangor the levy of development charge has been approved but the actual implementation is yet to be carried out.
The Selangor SSP was approved in 2003. The SSP identifies transit oriented growth centres to encourage use of public transport, however at the time of writing this document there is no explicit incentive and guidelines for TOD in Selangor.

Development charge is a tax meant to share the enhancement gains due to the action of the state or local authority to allow a higher value development for the site.

**Putrajaya**

The development of Putrajaya is based on a physical master plan approved in 1995. Perbadanan Putrajaya was incorporated on 1st March 1996 under the Perbadanan Putrajaya Act (Act 536), as a corporate body to administer and manage the city of Putrajaya. Under the current development planning system which is provided by the Town and Country Planning Act 1976, Perbadanan Putrajaya is the local planning authority responsible to formulate and implement planning and development control policies and the urban design guidelines to fulfil the objectives and vision of Putrajaya. The DLP for Putrajaya consists of two parts:

- Volume 1 - Proposal Map and Written Statement
- Volume 2 - Manual for Physical Planning Guidelines

The plan provides detailed planning for all plots of land indicating types of land use, road network, and underlines the planning requirements in terms of density, lot size, building heights, road network, utilities and landscape. It is used as a tool for development planning and development control by Perbadan Putrajaya for processing development applications.

Land use class order is used to facilitate Perbadanan Putrajaya in development control. The use class order is to be read together with the proposal map in controlling the activities of the specific land use, as a guide and statutory reference to generate layout and the development plans for newly planned areas, which are within the local plan area. The use class order identifies the degree of permissibility for the various land uses by the control of activities at 3 levels or degree of order:

- Permissible Activities
- Permissible Activities With Conditions
- Prohibited Activities

Putrajaya places much emphasis in ensuring its communities are adequately provided with walkways, a comprehensive monorail system and local bus network to encourage the use of land public transport. This is also to support its vision in creating a ‘Garden city' in harmony with the environment and establishing a modern and intelligent world class city. An ambitious 70:30 (land public transport : Private Vehicle) modal split was set with parking control strategies, i.e. reducing parking provision, introduction of parking charges and stricter enforcement of illegal parking, are also part of the travel demand management measures to encourage mode shift.

**Key Conclusions**

Currently, there are three levels of authorities – Federal, State and Local – administering land use planning matters as provided by the Town & Country Planning Act 1976.

Under the current planning system, only the local authority is empowered to grant or refuse planning application within its boundary.

In Kuala Lumpur the land use zoning map, plot ratio and density control (as per KLCP 2020) is used to regulate development by location, type, size and density.

Local authorities in Selangor set out detailed planning proposals in the local plan which needs to be consistent with the approved SSP to control development activities.

DLPs are used as a tool for development planning and development control by Perbadanan Putrajaya for processing development applications.
2 POLICY LEVERS AVAILABLE FOR USE
2 Policy Levers Available For Use

2.1 Introduction

This chapter will outline the rationales behind each of the measures within the context of Greater Kuala Lumpur/Klang Valley Master Plan.

Land use policies play a key role in achieving the Greater Kuala Lumpur/Klang Valley Master Plan objectives. By shaping the pattern of development and influencing the location, size, density, design and mix of land uses, land use policy levers can help to reduce the need to travel and make it easier for people to travel by land public transport and walking. In developing the Greater Kuala Lumpur/Klang Valley Master Plan, consideration is given to policy levers that can influence the land use planning process to favour public transport provision and performance in the region.

There are two approaches to achieve the above objectives:

- ‘Carrot’ initiatives (also referred to as ‘Pull’) which seek to provide a positive influence on land public transport demand through the following measures:
  i. Prioritise high density developments at land public transport accessible locations
  ii. Secure good land public transport access and facilities for new developments

- ‘Stick’ initiatives (also referred to as ‘Push’) which seek to provide a negative influence on private vehicle demand through the following measures:
  i. Development control to consider wider transport implications including land public transport
  ii. Deter developments generating high traffic demand in area with poor land public transport access
  iii. Parking control policies to promote mode shift to land public transport

2.2 Carrot Initiatives

Prioritise High Density Developments at Land Public Transport Accessible Locations

Land use planning should seek to make maximum use of the most accessible sites by land public transport, such as those in urban centres and others close to land public transport interchanges. Priorities and incentives should be given to facilitate intensification of developments in these areas to encourage employment and population within walking distance to land public transport services.
Urban Centres

Developments in urban centres tend to be dense and concentrated due to high land price and limited land supply. Enhancing the working, living and business environment of the urban centre would attract activities in city centre; and as a result providing critical mass which can act as a potential source of demand for public transport and make high quality land public transport provision viable.

These can be achieved via the following objectives:

- Revitalisation of inner city through urban gentrification
- Encourage large scale retail centres to urban centres
- Encourage infill and redevelopment to urban centres
- Enhance safe and walkable environment - more pedestrian friendly linkages
- Improve physical pedestrian connectivity to desired destinations

The challenge for urban gentrification is to balance the need for diversifying the city into economically integrated communities with the need for affordable housing. The latter enables supply of a mix of residential homes even affordable to essential workforce (i.e. teacher, police and service workers) and minimise the impact of empty-nesters within the inner city.

It should be highlighted that the urban centre is not necessarily limited to KLCC but can be extended to include satellite centres such as Petaling Jaya, Shah Alam and Klang. In these areas underutilised rail lines coincide with brown field industrial sites just as old highway arterial corridors coincide with deteriorating commercial corridors. The redevelopment or infill of these brown field sites, which are often a good match for TOD should be prioritised.

Transit Oriented Development (TOD)

The land public transport network identified within the Greater Kuala Lumpur/Klang Valley Master Plan should be used as the guideline to assist the planning authorities in designating and implementing existing or TOD.

Via this plan, DBKL can extend the current 66 TPZs identified in the KLCP 2020 to cover new or improved rail and BRT corridors that are not available during the time of drafting the KLCP 2020. On the same note, the public transport corridors identified in the Greater Kuala Lumpur/Klang Valley Master Plan can also be used to assist Selangor in future planning and determining the incentives towards the developments of TODs.

It should be noted that sitting a development near a transit station is not an instant recipe for success. TODs are subject to market forces, i.e. changes in economic, demographic and market trends will exert pressure on TOD as much as other developments. Therefore, in promoting TOD in the region it is important not to focus only on high-end real estate development, but also consider good design principles such as:

- Promote mixed development of residential, commercial, employment and public realm within walking distances to the transit station
- Creating pedestrian friendly street network that directly connect local destinations
- Provide a mix of housing types, densities and costs
- Make public spaces the focus of building orientation and neighbourhoods
- Encourage infill and redevelopment along transit corridors within existing neighbourhoods
- Preserve sensitive habitat and high-quality open space

2.2.1 Secure Good Land Public Transport Access and Facilities for New Development Areas

The most challenging area for integrating land use with public transport development is in new development areas of expanding region. The viability of density and mix in new development is more difficult for achieving an efficient public transport system and the potential for high public transport mode share is often a long
term target. However it will be short-sighted not to have an evolving strategy for both land use and public transport planning for new development. Whether for bus or rail-based land public transport, it is important that direct and efficient access routers are provided to equip developments with appropriate high quality facilities such as bus stops, shelters and bus stations as necessary.

For new development areas that do not enjoy the natural benefits of being ‘location efficient’, the state and local authorities can start progressive planning by securing good land public transport access and facilities to the development by designating and reserving rights-of-way for land public transport corridors, land public transport network planning and integrating community facilities to encourage use of land public transport and reduce the dependency to private vehicles for travel. As a start the new development needs to be planned and provided with adequate accessibility to land public transport services before planning approval is given. This ensures land public transport is a viable and indeed an attractive option for the residents and visitors of the new development. The preserved rights of ways could be utilised later when surrounding development has matured to support a demand for more intensive land public transport system. In addition plan should include pedestrian linkages to create a safe walking environment that enhances public transport catchment areas.

Alongside good physical access and facilities, the land-use planning process should be used to help secure effective TDM measures such as good information, promotion of land public transport services and measures to reduce car use.

‘Carrots’ initiative include:
- Prioritise high density developments in land public transport accessible locations.
- Securing good land public transport access and facilities to the new development areas.

2.3 Stick Initiatives

To ensure a holistic approach towards influencing the land use planning process comprehensive solutions ‘Stick’ initiatives need to be included to address the following challenges:

- Current trend of urban sprawling is exacerbated by developments favouring car users only being approved in piece-meal fashion (i.e. without considering the impact to land public transport)
- The impact of rapid population growth and the changes in socio-economic (i.e. higher car ownership) and improved highway infrastructure pose new challenges for promoting use of land public transport.

2.3.1 Development Control to Consider Wider Transport Implications of Development Including Land Public Transport

The Greater Kuala Lumpur/Klang Valley Master Plan should be used to guide the planning authorities in reviewing and prioritising the new development areas to ensure developments are closed to land public transport corridor and developed in a way that is receptive to adding density and more land uses over time. Planning for phasing and land banking is essential to ensure a sustainable approach towards the better integration of land use and transport.

The aim of development control is to ensure land use development is in accordance to the SSP or DLP. The development control process often involves land use zoning, density, parking and plot ratio control to prevent incompatible land use development and preserve the desired functions and characters of the land use zoning. In this regard, DBKL adopts the Kuala Lumpur Development Control Plan 2008 (which is conformed to the KLCP 2020) for the purpose of providing guidelines to development and use of land in the Kuala Lumpur city. In Selangor respective local
plans containing details of allowable land use and development size are used for the same purpose.

Under the current process, major developments will be required to include a Traffic Impact Assessment (TIA) report to provide quantitative analysis and qualitative assessment of the effects that the proposed development have on the surrounding highway network, and the scope for mitigating them. There is however no specific requirement on the assessment of public transport provision and performance.

To protect the interests and amenities of a larger community in particular the public transport users, it is necessary for the Greater Kuala Lumpur/Klang Valley Master Plan to set out a framework to enable local planning authorities to assess the capacity of public transport network before a decision on the planning application is rendered. It is important to identify the land public transport network and capacity in order to establish the new demand generated by the development can be accommodated by the land public transport provision, and where applicable, to identify improvement or mitigation measures to address any shortfall in capacity.

In United Kingdom for instance, where a new development is likely to have significant transport implications, a Transport Assessment (TA) that considers wider transport implications of a development including public transport, cycling and walking, needs to be submitted to support the planning application. TAs are normally produced by developers and used by authorities in the planning process to determine whether the impact of development on transport is acceptable.

A similar approach should be applied in Greater Kuala Lumpur/Klang Valley Master Plan where the narrow focused TIA be expanded to TA that addresses not only traffic impacts on the local and regional road network, but also public transport, cycling and walking. The TA could provide the basis for development charges and/or financial contribution associated with measures of land public transport improvement.

2.3.2 Deter Developments Generating High Traffic Demand at Locations with Poor Land Public Transport Access

Financial Contribution can be used as an effective tool to deter developments generating high traffic demand at locations with poor land public transport access. The contribution can also be used to provide essential funding to improve the public transport provision and performance in the vicinity of the development and to minimise the adverse effects of development with poor public transport connectivity.

At present, developers in Greater Kuala Lumpur/Klang Valley may be levied with the following form of financial contributions as part of the requirements to obtain planning approval:

- Development charges for planning application on change of plot ratio, density and/or land use
- Contribution to improvement of road and drainage
- Introduce requirement for developers to build or fund construction of pedestrian linkages and/or bus stop

It is recommended that more rigorous policy or compound should be pursued and the contribution shall not be limited to infrastructure improvement. For example, a developer may be asked to provide contributions towards land public transport service improvement such as new bus service or extending bus routes to the development and increasing bus frequencies. The level of contribution identified should be based on mitigation measures required to provide an adequate level of public transport service and the extent of development traffic generated. As a rule of thumb, development generating higher traffic but without adequate public transport link within walking distance shall pay higher contributions. Such policy is also intended to act as deterrent to discourage current urban sprawling trend, or at least minimise the adverse effects of high traffic generating land use developments in areas without good public transport link.
2.3.3 Parking Control to Promote Mode Shift to Land Public Transport

The availability of car parking has a major influence on the means of travel particular for journey to work. In some cases the level of parking can be more significant than the level of land public transport provision in determining the way people travel to work, even at locations accessible by land public transport.

Therefore, as part of a package of land use and travel demand management measures the local authorities should consider:

- In places well served by land public transport (i.e. TOD) maximum parking standards shall be considered to ensure developers do not provide more parking spaces than what is needed given the existence of good land public transport services, other than in exceptional circumstances where there are significant implications for road safety. This will make private car less attractive and in turn promote mode shift to land public transport. Nevertheless, caution shall be practiced so that the different requirements of parking levels between urban centres/TOD and other locations shall not create perverse incentives for development to locate away from urban centres/TOD. This requires a balanced approach for parking requirements in all developments.

- Encouraging shared use of parking particularly in urban centres and major mixed developments where the peak levels of parking do not coincide. Attention need to be given at the planning and design stage.

- Strengthening the enforcement of on-street parking controls to minimise illegal parking adjacent to major developments and in urban centres.

- For the Local Authorities to use land use/ activity licences to apply variable parking charges to non-Park & Ride facilities, where areas near by land public transport stations would pay higher rates relative to car parking areas further away from land public transport stations.

‘Stick’ initiative include:

- Development control process needs to consider wider transport implications of a development including public transport.

- Deter high traffic demand developments at location with poor public transport access.

- Parking control to encourage mode shift to land public transport.
3 DEVELOPING MECHANISMS
3 DEVELOPING MECHANISMS

3.1 Introduction
This chapter identifies the mechanism where the Greater Kuala Lumpur/Klang Valley Master Plan can collaborate with state and local planning authorities to yield more effective influence in the planning process.

3.2 Key Challenges
The primary aim of this LUP is to develop mechanisms to influence land use policies and planning process in the Greater Kuala Lumpur/Klang Valley region to favour public transport provision and performance. The followings are key challenges facing in promoting land use policies and the planning process:

- Assessment of land public transport provision and performance is not an explicit requirement under the current land use planning process
- There is no mandatory requirement for developments in area without good land public transport access to contribute towards land public transport improvement or development scale to be limited due to the lack of good land public transport access
- Fragmented roles and responsibilities between authorities in coordinating land use development and transport planning

3.3 Mechanisms
This section focuses on developing mechanisms to integrate land use planning closely with public transport provision, and provide a framework where SPAD can work efficiently with state and local authorities to ensure the Greater Kuala Lumpur/Klang Valley Master Plan strategies are consistent with their overall strategy on planning and transport.

3.3.1 Development Control
Development control process helps local authorities assess the development’s compatibility with the relevant planning policy framework i.e. DLP. To enable wider transport implications of proposed developments to be properly considered, it is recommended that:

- Local authorities, in consultation with SPAD, should seek to make best use of the existing development control process to make land public transport assessment a mandatory requirement to support a planning application. It is recommended that the TIA to be expanded to TA to include assessment of the existing and targeted land public transport mode share and how the new development traffic can be adequately accommodated by the land public transport network. Suitable mitigation measures for improving land public transport provision and ensuring good access to the development need to be included where necessary.
• Local authorities should consult SPAD in the planning application process, i.e. seeking technical guidance and resources in developing technical guidelines and seeking assistance to assess the land public transport provision. Where necessary, SPAD may recommend granting or refusing planning permission depending on whether the impact of the development on public transport is acceptable and whether the development and its land public transport provision properly supports the Greater Kuala Lumpur/Klang Valley Master Plan.

• Local authorities to take a more pro-active approach towards extending the existing policies or scope of financial contributions/compound to include elements of land public transport improvement. In short term this can be done by use of planning conditions stipulated in the DO issued for planning approvals if appropriate, and for negotiation with developers on the use of planning obligations as appropriate, to ensure the development is provided with adequate land public transport infrastructure and services. In long term it is recommended that local authorities, in consultation with SPAD, seek amendment to current legislation and acts to formally include the scope for land public transport improvement. For example, at present new developments in Kuala Lumpur are required to contribute to Improvement Service Fund (ISF) for road and drainage. But this should be extended to cover land public transport improvement. The contribution shall not be limited to fund the construction or improvement of public transport infrastructure (i.e. new bus stop, bus priority access or pedestrian footpath to land public transport stations/stops) but also act as subsidy to provide new or improved public transport services (i.e. new bus route) to the development for a period of time i.e. one to five years.

3.3.2 Financial Incentives or Contribution

The availability of financial incentives or penalty will play an important role in determining the land use development patterns and priorities. The incentives will encourage allocation (or reallocation) of sites which are or will be highly accessible by land public transport for travel intensive land uses, while the penalty would act as deterrent to discourage allocation of travel intensive development sites to areas not well served by land public transport.

In supporting the above aims the following financial mechanisms should be considered:

• Build and leverage State and Local government capacity via targeted funding i.e. SPAD Fund or land Public Transport Fund, in order to constructively influence land use planning process to favour land public transport provision. Where necessary, SPAD can seek to leverage other sources of capital to enable more incentives available for such purpose.

• Use clever and prudent mechanism to package funding with conditionality (i.e. grant or performance contract) to exercise some control in determining land use development patterns and priorities, by providing incentive only to land use planning or developments consistent with the Greater Kuala Lumpur/Klang Valley Master Plan objectives.

• Influence development patterns through enforcement of financial contributions where high density developments located at areas with poor access to land public transport need to pay higher development charges for diverting the land public transport services to the development. The contribution generated can provide funds for future land public transport improvements to minimize adverse traffic impacts on the land public transport users, and to act as a premium to discourage travel intensive land use at areas not well served by/and public transport.
3.3.3 Partnership with State and Local Authorities

The existing institutional arrangement, where the responsibility of the land use development and planning generally rests with the state and local authorities, makes it difficult for SPAD to directly influence the land use planning process to promote the use of land public transport.

The following suggestions are proposed to help overcome the above ‘barrier’ and develop good partnerships between SPAD and local authorities, which are integral in achieving the objectives of this LUP.

SPAD should ensure engagement of these authorities throughout the Greater Kuala Lumpur/Klang Valley Master Plan development and implementation process. Likewise the state and local authorities should discuss their land use development and planning proposals with SPAD at the earliest stage:

- SPAD to work with state and local authorities in promoting, designating and implementing TODs that meet the wider objectives of the Greater Kuala Lumpur/Klang Valley Master Plan.
- SPAD to provide technical guidance (i.e. use of Planning Guideline) and resources to assist local authorities in assessment of land public transport provision and performance during the land use planning and development control process.
- SPAD to assist state and local authorities in making amendment to existing legislation in order to extend the scope of financial contribution to include land public transport improvement. The money (i.e. development charges, ISF) generated from this shall be reinvested into the improvement of land public transport services.
- Develop a formal arrangement with state and local authorities where SPAD will act a statutory consultee in future land use planning and development control process to promote and coordinate development that meets the Greater Kuala Lumpur/Klang Valley objectives.

Key Conclusion

Focus on developing mechanisms to integrate land use planning with public transport, and provide a framework where SPAD can work efficiently with State and Local Authorities.

These include:

- Development control process needs to ensure land public transport assessment is included as part of the requirements of a planning application.
- Using the development control process to secure good land public transport access and facilities are provided.
- Leveraging financial incentives/funding to encourage allocation of travel intensive land uses at sites highly accessible by land public transport; while imposing contribution/penalty to act as deterrent to discourage such sites to area not well served by land public transport.
- Developing good partnerships with State/Local Authorities to gain support in achieving the aims of LUP.
4 SUMMARY
SPAD has developed the National Master Plan to set out the vision and direction for land public transport in Malaysia. The purpose is to develop a long term programme to address the current deterioration in land public transport with plans to execute high impact and effective delivery initiatives for a 20-years sustainable national land public transport service.

The National Master Plan outlines the National Land Public Transport Policy which provides guidance and direction towards developing the National Master Plan. Included in the National Master Plan is also a Planning Guidelines which provides the guidance on the methodology for setting objectives, plan development, identification of policy measures and assessments of solutions. The Planning Guidelines facilitates the development of Regional Master Plans and enables interfacing with State-specific plans and land use policies.

The first Regional Master Plan developed by SPAD is for the Greater Kuala Lumpur/Klang Valley region. The LUP is one of six Subsidiary Plans of the Greater Kuala Lumpur/Klang Valley, and relates to land use in the region. Together these six plans provide an integrated land public transport plan for the Greater Kuala Lumpur/Klang Valley region.

In order to aid the development of the Greater Kuala Lumpur/Klang Valley Master Plan, a series of Guiding Principles have been developed examining issues related to accessibility, capacity, social inclusion and the environment.

The LUP is aimed to develop mechanisms to influence land use policies and planning process in the Greater Kuala Lumpur/Klang Valley region to favour public transport provision and performance in support of the overall Greater Kuala Lumpur/Klang Valley Master Plan objectives.

Land use policies play a key role in delivering the Greater Kuala Lumpur/Klang Valley Master Plan objectives. By shaping the pattern of development and influencing the location, density and mix of land uses, land use policy levers can help to reduce the need to travel and make it easier for people to travel by land public transport and walking.

Consideration is given to two types of policy levers:

- ‘Carrot’ initiatives that seek to provide a positive influence on land public transport demand through:
  
  i. Prioritise high density developments at land public transport accessible locations
  
  ii. Secure good land public transport access and facilities for new developments
• ‘Stick’ initiatives which seek to provide a negative influence on private vehicle demand through measures:
  
  i. Development control to consider wider transport implications including land public transport
  
  ii. Deter developments generating high traffic demand in area with poor land public transport access
  
  iii. Parking control policies to promote mode shift to land public transport

Developing pragmatic and practical mechanisms where SPAD can constructively intervene in the planning process to favour public transport is integral to achieving the objectives of Greater Kuala Lumpur/Klang Valley Master Plan.

These include:

• As part of the development control process Local Planning Authorities should make land public transport assessment a mandatory requirement. SPAD can provide technical guidance and resources to develop technical guidelines and assist in the assessment.

• Financial incentives to encourage land use developments (i.e. TOD) that are supportive to the Greater Kuala Lumpur/Klang Valley Master Plan objectives while consider using financial contribution to discourage high density development at locations without good access land public transport.

• SPAD should seek to develop long-lasting good partnerships with state and local authorities. This will help to gain local authorities support in the wider objectives of Greater KL/Klang Valley Master Plan and to promote the integration between land use and land public transport planning throughout the development of land use policies and planning process.
TRAVEL DEMAND MANAGEMENT PLAN
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1 BACKGROUND
1 BACKGROUND

1.1 Introduction

The TDMP is to set the basis for the development of travel and demand management, which can function as ‘glue’ to join all the land public transport modes together to enable easier, quicker and more convenient transfers between land public transport services. This will result in wider ranging and more frequent travel opportunities for land public transport users in Greater Kuala Lumpur/Klang Valley.

TDMP is a complementary policy to the measures outlined in the Subsidiary Plans of the National Master Plan to encourage modal transfer from private vehicles. In this chapter, the distinction between policy levers which seek to influence supply and demand for public transport is summarised. The chapter summarises the alternative measures that can be adopted with Appendix A providing more details of the TDMP measures and international examples where they have been introduced.

1.2 Supply and Demand Policy Levers

In developing the National Master Plan, consideration is given to the types of policy levers that can influence the supply and demand relationships for public transport. The aim for the Greater Kuala Lumpur/Klang Valley Region is to increase land public transport modal share which will require an increase in overall ridership. The supply side policy levers seek to increase the supply of public transport to facilitate greater ridership which can be achieved through measures to increase capacity such as:

- Expanding existing services (e.g. providing longer train sets)
- Extending the coverage of the existing land public transport network
- Improving service quality
- Developing new land public transport systems
- Improve interchange between modes

These approaches are taken as the building blocks for the National Master Plan as outlined in the Subsidiary Plans (BTP, TTP, and URDP). However in many circumstances there is a need for demand led shifts which seek to increase the usage of land public transport within the existing supply levels or in tandem with supply based measures.

For the Demand side policy levers, there are two basic approaches to achieving a demand shift to public transport from private transport. The first are termed ‘pull’ initiatives (sometimes also referred to as ‘Carrots’) which seek to provide a positive influence on demand through measures such as:

- Integrated ticketing
- Encouraging flexible working hours and telecommuting in order to spread the peak period travel demands
- Travel Planning Information
- Advertising Campaigns
- Developing priority measures for bus, taxi and non-motorised modes
- Workplace and School Travel Plans
The second set of approaches are termed ‘push’ initiatives (sometimes referred to as ‘Sticks’) which seek to provide a negative influence on private vehicle demand through measures such as

- Vehicle use restrictions
- Parking controls
- Fuel and taxation
- Road user charges (RUC)

Each of these measures can be considered as TDMP tools.

The approach considered for the Greater Kuala Lumpur/Klang Valley Master Plan is to assess the contribution of push/pull demand side interventions along with supply side initiatives to maximise land public transport patronage and encourage modal shift.

1.3 Objectives of Travel Demand Management Plan

Across the world there are a number of objectives of TDMP measures as shown in Figure 1.1. TDMP measures achieve these goals through a range of measures aimed at:

- Improving users knowledge and confidence in land public transport to encourage greater take-up
- Improving efficiency to reduce car use and support land public transport through measures such as car-pooling, flexible working or tele-working
- Pricing policies to deter car use and create mode-shift
- Restrictions on car use to deter their use and create mode-shift
- Promotion and marketing to change attitudes to land public transport and encourage re-consideration of land public transport (particularly in tandem with land public transport improvements).

The selection of the TDM measure often reflects the priority of the objectives being considered. Among the common objectives for TDM include:

- The reduction of congestion by measures aimed at reducing peak period demands
- Achieving a behavioural change to encourage a modal transfer from private vehicles to public transport
- Increasing the efficiency of the network such that the focus is on the movement of people rather than private vehicles
- Reducing emissions so as to have a positive impact on the environment
- Generating revenue which can be used to support public transport policies and services.

Figure 1.1: Objectives of Travel Demand Management Measures

1.4 Types Of Travel Demand Management Plan

The initial consideration for TDMP is to build upon supply based methods to encourage land public transport modal share by the enhancement of the land public transport modes themselves. In essence this is one of the key planks of the National Master Plan and is reflected in each of the Subsidiary Plans developed for the Greater Kuala Lumpur/Klang Valley Master Plan. These approaches include the supply initiatives to increase capacity such as:

- Improve and expand and existing services (e.g. providing longer train sets reflected in the UDRP or the provision of feeder bus services in the BTP)
Chapter 5: Travel Demand Management Plan

Key Conclusions

Policy levers to influence public transport usage are aimed at influencing supply through the improvement of service, increase of capacity and provision of new services.

Policy levers can also seek to influence demand, either positively by encouraging land public transport or by negative influence on private vehicle demand such as the use of pricing

TDMP Measures are a series of measures aimed at encouraging travel by sustainable modes in order to reduce the reliance on private vehicle transport

- Increase the coverage of the existing land public transport network (reflected in the URDP through the extensions to existing lines)
- Improve service quality (reflected in each of the URDP, BTP and TTP) to encourage greater use
- Provision of new land public transport systems (such as the MRT lines in the URDP or the BRT corridors and feeder bus services in the BTP)
- Improved interchange between modes (reflected in the Interchange and Integration Plan - IIP)
- Integrated ticketing (reflected in the IIP)

The different types of TDMP measure that have been used across the world are explained in more detail in Appendix A. These include the ‘pull’ and ‘push’ initiatives.

The ‘Pull’ measures (or ‘Carrots’) include:

- Travel Information Systems - including travel planners (paper based, mobile phone or other electronic systems- and real time information systems
- Advertising Campaigns publicising the availability of land public transport

The ‘Push’ measures (or ‘Sticks’) include:

- Vehicle Use restrictions - measures to limit vehicle usage place greater reliance on road space for land public transport and non-motorised users at the expense of the private vehicle. Such measures might include the provision of bus lanes by reducing the number of lanes for private vehicles through to complete restrictions on vehicle movement in local areas
- Fuel and Taxation policy - In many countries fuel and taxation policy is used to reduce private vehicle usage by increasing the price of fuel above the rate of inflation or taxing the purchase of new vehicles or the annual duty levied on a vehicle. The key consideration in relation to this policy is that it affects all motorists and in particular, penalises motorists in areas with little land public transport choice
- Parking Controls - A more targeted approach to increasing private vehicle costs is to apply controls on parking, either through limiting the supply (such as reducing the number of spaces or re-allocating between long stay and short stay users) or by pricing, either directly by increasing charges or by the use of Workplace Parking levies
• Road User Charges (RUC) - RUC schemes (also called urban congestion charging or road pricing) involve directly charging drivers for the use of the roads on which they drive. The charges are designed to reduce traffic congestion and its associated problems. Charging systems can reduce traffic levels by typically 15 to 20 per cent. However they can also offer even more substantial reductions in traffic congestion help improve journey time reliability, lead to reduced vehicle emissions, reductions in accidents, improvements in the quality of the public realm and enable road-space to be released for use by land public transport. They also raise revenue which may or may not be ploughed back into the transport system, enabling improvements to be made to the road network and/or public transport.

1.5 Selecting Appropriate Travel Demand Measures

Appendix A outlines the range of TDMP measures that have been adopted across the world. In this section those measures which have the greatest potential for inclusion in the Greater Kuala Lumpur/Klang Valley Master Plan are identified. Table 1.1 provides a summary of the measures and their potential role in Greater Kuala Lumpur/ Klang Valley. In this section they are divided into a series of groups:

• Non-motorised modes
• Information and Travel Planning
• Priority Measures
• Car based reduction measures
• Pricing Mechanisms

1.5.1 Non- Motorised Modes

Walking infrastructure is an important consideration for the ‘first and last mile’ of a public transport journey. Access between public transport and the users’ origin or destination is crucially important to reduce the barrier of using public transport. Pedestrian access to bus stops and railway stations should be encouraged as part of the local authority development plans. Walking catchments should be defined around transit stops within which audits should be undertaken to assess:

• Footway characteristics
• The use of covered walkways for major pedestrian access routes as appropriate
• Crossing facilities (whether at-grade or grade separated);
• Information provision to identify key walking routes
• Safe walking routes to key origins and destinations

Consideration to this issue is given consideration in the IIP. It is noted that the KLCP 2020 is seeking to enhance the pedestrian environment in the city centre. Strategic Direction 5.13 seeks to provide a safe and comfortable walking environment for all groups of pedestrian network users. Strategic Direction 5.14 of the KLCP 2020 ‘Increasing Connectivity, Accessibility & Mobility of Pedestrian throughout Kuala Lumpur City Centre’ seeks to provide an interconnected pedestrian network throughout major nodes and activity centres in Kuala Lumpur City Centre. The aim is to encourage walking as the preferred mode of travel in the central core through three phases:

• Phase 1: Major Spine - a 3 km spine from Dataran Merdeka to Chow Kit Kuala Lumpur Monorail Station through Jalan Tuanku Abdul Rahman
• Phase 2: 14 km of primary pedestrian walkways connecting major activity centres and transit nodes
• Phase 3: Construction of secondary pedestrian walkways involving two waves where the first wave of secondary walkway connects the key pedestrian walkways ranging nine kilometres and extended by the second wave which extend the pedestrian coverage throughout the city centre

Outside the city centre improvements, SPAD should work with the local authorities to enhance the pedestrian environment facilitating access to land public transport.
Chapter 5: Travel Demand Management Plan

The inclusion of cycle infrastructure is also a consideration for the first and last mile, particularly for rail passengers. Local access to railway stations with appropriate cycle parking facilities is important. This is considered within the IIP of the Greater Kuala Lumpur/Klang Valley Master Plan. A number of cities across the world have introduced central area Cycle Hire schemes. For example, Paris introduced the Velib scheme which has over 20,000 bicycles for hire and 1200 bike stations. Where these cities have introduced the cycle schemes they are supported by cycle infrastructure such as cycle ways. In the context of the Greater Kuala Lumpur/ Klang Valley Region, the central area road network does not lend itself to cycling. Therefore in the context of the National Master Plan focus should be on access to stations.

1.5.2 Information and Travel Planning

Within the BTP, land public transport Information provision is identified as being crucial to enhance the perception of public transport. This includes the provision of:

- Timetable and route information at bus stops and stations
- Paper based timetables and route information
- Web-based information systems
- Electronic journey planners on the web and portable phone (this can include stop information, location of buses, route planners).

Use of improved information is important for enhancing the image of land public transport in the region. The upgrading of the route permit information in the SPAD licensing regime will assist in the identification of bus service schedules. Route permits should identify the routes served, the stops, proposed headways and first and last buses. These data will allow timetables to be developed, initially as paper based systems or for stops, but in the longer term can be used to derive web-based and mobile phone based information systems. With the introduction of a bus stop index system, and the tracking of buses by GPS, the building blocks of a real time information system can be derived for implementation in the longer term. SPAD will actively manage and encourage the development of information systems starting with paper based systems leading eventually to a real time information system and journey planner. Electronic journey planners will allow users to identify the choice of land public transport mode for their journey based on real time information related to the current network and schedule situation to help plan their journeys.

With the development of good information systems, initiatives such as Personalised Travel Planning (PTP) can be developed to make transport systems more efficient. PTP involves teams of travel advisors, trained in the local transport, walking and cycling infrastructure, talking one-to-one with residents to gauge what their current primary modes of transport are, and then to educate and inform them of alternatives they may not have considered and supplying them with information and incentives to help them substitute regular car journeys with more sustainable and less congested transport methods. Such methods have been adopted in the United Kingdom and Australia. For example, in Adelaide, one project engaged over 20,000 households in structured conversations about reducing car use.

Travel Planning should also be encouraged in workplaces and schools. Major generators of travel demand should be encouraged to develop Travel Plans with the aim of reducing the reliance on the private vehicle in the peak periods. These plans can be defined as a package of measures produced by employers to encourage staff to use alternatives to single-occupancy car use. Travel plans are now common in the United Kingdom, and are becoming common in Australia and New Zealand. A workplace could choose to develop a travel plan at any time, or it could be required to develop a travel plan as a condition of planning consent for an expansion or new development. The types of initiative included in the workplace travel plan include improving facilities for pedestrians and cyclists (showers, lockers and cycle parking), promotion and subsidy of public transport, encouraging carpooling, working from home and teleconferencing. Similar Travel Plans can be established for schools to encourage walking, cycling and the use of public transport.
1.5.3 Priority Measures

The provision of bus and taxi lanes as priority should be encouraged in the Greater Kuala Lumpur/ Klang Valley Region. These should be backed up by appropriate enforcement measures to ensure they are utilised correctly. The emphasis should be on these rather than High Occupancy Vehicle (HOV) lanes to provide greater reliability for bus services, particularly those in BRT corridors. In comparison with other major cities, the provision of bus lanes is low. There are only 11km of bus lane in Kuala Lumpur compared with 155 km in Singapore. The BTP outlines the use of bus lanes in the region to support BET, BRT and other bus services and the need to improve bus reliability. As traffic growth continues in the region there will be a greater need to protect buses from increased congestion and the need to develop a bus priority network. This will encourage modal transfer from private vehicles.

1.5.4 Car Based Reduction Measures

Car Pooling (the shared use of a private car for a journey often by people in a common workplace with similar journeys) and car sharing schemes (used as a car rental where people rent cars for short periods) could be promoted in the region but are likely to have only a small impact on overall private vehicle demands and thus little impact on land public transport modal share. They would require the support of local businesses and may be appropriate for some major employers. They are not included as a potential policy measure for the National Master Plan.

Car free zones and car free developments should be encouraged by the local authorities on a local basis where they are appropriate. Car free developments are typically residential or mixed use developments built as new and offer a limited internal road network and parking and are therefore designed for residents without access to a car. The key element will be the use of stricter development control procedures as outlined in the Land Use Subsidiary Plan which will seek to reduce the reliance on private vehicles and encourage land public transport usage. Alongside development control procedures for parking controls these measures will help to reduce demands from new developments in the future.

An alternative approach to restricting car use is to limit the days on which particular vehicles can enter a city. Registration plate (licensed) traffic restraint policies based on travel by alternative number plates have been tried in cities such as Athens and Mexico City. These have been found to have operational issues and are not considered appropriate for Greater Kuala Lumpur/ Klang Valley Region. Instead a focus more on parking control and in the longer term road user charging would be preferred.

1.5.5 Pricing Mechanisms

In many countries fuel and taxation policies are used to reduce private vehicle usage. Policies include additional taxes on fuel, new car purchases or the annual vehicle excise duty. These have been found to have an impact on the purchase and use of private vehicles. However such a policy would need to be set at a national level and in the context of Malaysia could have a significant impact on the local car manufacturing industry. Policies of fuel price increase can have a greater impact in rural areas where journey lengths are longer and there is little alternative land public transport choice. Therefore in the context of Greater Kuala Lumpur/Klang Valley a more targeted traffic restraint policy would be required to encourage land public transport use through restrictions on car use through pricing in the local area. Should policies on fuel and vehicles be considered by central Government, then SPAD will seek to ensure that the revenues are fed back to SPAD for use in the Local land public transport fund to support land public transport services across the nation.

A more targeted restraint policy can be applied through parking policies by controls on the duration, location and price of parking. Many cities have introduced innovative parking policies as part of an overall transport strategy to encourage land public transport use.
Table 1.1: TDM Measures for Inclusion

<table>
<thead>
<tr>
<th>TDMP Measure</th>
<th>Partner Involvement</th>
<th>Impact On Land Public Transport Demand</th>
<th>Impact on Private vehicle demand</th>
<th>Include in Greater Kuala Lumpur/ Klang Valley Master Plan</th>
<th>Cost</th>
<th>Speed of Implementation</th>
<th>Pre-conditions</th>
<th>Reason for not including</th>
</tr>
</thead>
<tbody>
<tr>
<td>Walking Infrastructure</td>
<td>Local Authority</td>
<td>Low</td>
<td>Low</td>
<td>Yes</td>
<td>Low</td>
<td>Short-term</td>
<td>Ensure appropriate standards are defined</td>
<td></td>
</tr>
<tr>
<td>Cycling Infrastructure</td>
<td>Local Authority</td>
<td>Low</td>
<td>Low</td>
<td>Only in terms of the first and last mile</td>
<td>Low</td>
<td>Short-term</td>
<td>Low % use of cycling in Kuala Lumpur.</td>
<td></td>
</tr>
<tr>
<td>Information Systems of timetable and routes</td>
<td>Local Authority</td>
<td>Medium</td>
<td>Low</td>
<td>Yes</td>
<td>Low</td>
<td>Short-term</td>
<td>Land public transport route information, GPS units on all land public transport vehicles</td>
<td></td>
</tr>
<tr>
<td>Car Pooling (shared use of private cars)</td>
<td>Business/ private sector</td>
<td>Low</td>
<td>Low</td>
<td>Yes</td>
<td>Low</td>
<td>Short term</td>
<td>Major employer support</td>
<td></td>
</tr>
<tr>
<td>Car Sharing (Car rental)</td>
<td>Business/ private sector</td>
<td>Low</td>
<td>Low</td>
<td>No</td>
<td>Low</td>
<td>Short-medium</td>
<td>Schemes could be promoted but with only have minimal impact</td>
<td></td>
</tr>
<tr>
<td>HOV Lanes</td>
<td>Local Authority/MOW</td>
<td>Low</td>
<td>Low</td>
<td>No</td>
<td>Low</td>
<td>Short term</td>
<td>Enforcement difficulties and high vehicle occupancy in Kuala Lumpur/ Klang Valley</td>
<td></td>
</tr>
<tr>
<td>Bus Lanes</td>
<td>Local Authority/MOW</td>
<td>Medium</td>
<td>Low</td>
<td>Yes</td>
<td>Low</td>
<td>Short term</td>
<td>Focus should be on bus and taxi lanes rather than encouraging car use</td>
<td></td>
</tr>
<tr>
<td>Car Free Zones</td>
<td>Local Authority</td>
<td>Low</td>
<td>Low medium</td>
<td>Yes</td>
<td>Low-medium</td>
<td>Medium</td>
<td>Enforcement</td>
<td></td>
</tr>
<tr>
<td>New developments- car free</td>
<td>Local Authority</td>
<td>Low</td>
<td>Low medium</td>
<td>Yes</td>
<td>Low-medium</td>
<td>Short-medium</td>
<td>Support from local authorities</td>
<td></td>
</tr>
<tr>
<td>Licensed based Traffic Restraint System</td>
<td>Local Authority</td>
<td>Medium</td>
<td>Low medium</td>
<td>No</td>
<td>Medium</td>
<td>Medium term</td>
<td>Needs national policy decision, likely to be unfair on rural areas or those with no land public transport</td>
<td></td>
</tr>
<tr>
<td>Taxes on Fuel</td>
<td>MOF</td>
<td>Medium</td>
<td>High</td>
<td>No</td>
<td>Low</td>
<td>Short - Medium</td>
<td>All areas well served with land public transport</td>
<td></td>
</tr>
<tr>
<td>New Car Purchase Taxation</td>
<td>MOF</td>
<td>Low</td>
<td>Medium</td>
<td>No</td>
<td>Low</td>
<td>Short - Medium</td>
<td>Is done to an extent on foreign cars but would affect local product</td>
<td></td>
</tr>
<tr>
<td>Vehicle Excise Duty (Road Tax)</td>
<td>MOF</td>
<td>Low</td>
<td>Medium</td>
<td>No</td>
<td>Low</td>
<td>Short - Medium</td>
<td>Needs national policy decision, likely to be unfair on rural areas or those with no land public transport</td>
<td></td>
</tr>
<tr>
<td>Parking Charges</td>
<td>Private sector</td>
<td>Medium</td>
<td>Medium</td>
<td>Yes</td>
<td>Low</td>
<td>Short term</td>
<td>Private sector car parks support</td>
<td></td>
</tr>
<tr>
<td>Parking Supply</td>
<td>Local authorities</td>
<td>Medium</td>
<td>Medium</td>
<td>Yes</td>
<td>Low</td>
<td>Short - Medium</td>
<td>Development control conditions</td>
<td></td>
</tr>
<tr>
<td>Parking Sales Tax</td>
<td></td>
<td>Medium</td>
<td>Medium</td>
<td>No</td>
<td>Medium- Long Term</td>
<td>Free spaces in suburban areas for parking</td>
<td>Concern over increase in free spaces, particularly in suburban areas</td>
<td></td>
</tr>
<tr>
<td>Parking Levy</td>
<td>DBKL/ LA’s</td>
<td>Low</td>
<td>Medium</td>
<td>Yes</td>
<td>Low-medium</td>
<td>Medium- Long Term</td>
<td>Needs enforcement system, The charge likely to be borne by employers</td>
<td></td>
</tr>
<tr>
<td>Development Control</td>
<td>DBKL/ LA’s</td>
<td>Medium</td>
<td>Medium</td>
<td>Yes</td>
<td>Low</td>
<td>Medium- Long Term</td>
<td>Support from local authorities</td>
<td></td>
</tr>
<tr>
<td>Cordon Road User Charge</td>
<td>DBKL/ LA’s/ MOW</td>
<td>High</td>
<td>High</td>
<td>Yes</td>
<td>High</td>
<td>Medium- Long Term</td>
<td>Ensuring land public transport alternatives are in place</td>
<td></td>
</tr>
<tr>
<td>Corridor / Point Road User Charge</td>
<td>DBKL/ LA’s/ MOW</td>
<td>Medium</td>
<td>Medium</td>
<td>No</td>
<td>High</td>
<td>Medium- Long Term</td>
<td>Limited impact on demand compared to cordon</td>
<td></td>
</tr>
<tr>
<td>Network Road User Charge</td>
<td>DBKL/ LA’s</td>
<td>High</td>
<td>High</td>
<td>No</td>
<td>High</td>
<td>Medium- Long Term</td>
<td>More politically acceptable as a central area cordon</td>
<td></td>
</tr>
<tr>
<td>Area Licence</td>
<td>DBKL/ LA’s/ MOW</td>
<td>High</td>
<td>High</td>
<td>No</td>
<td>High</td>
<td>Medium- Long Term</td>
<td>Could be a cordon or licence</td>
<td></td>
</tr>
</tbody>
</table>
transport modal share. The use of parking controls as a policy instrument is discussed in the Land Use Plan. Approaches include:

- Increasing parking tariffs - which typically works if the spaces are under the control of a local authority
- Restricting the number of spaces (through development control processes and for local authority public spaces)
- Restricting the length of time users can park - such that long stay users such as commuters are encouraged to use land public transport
- Introducing a parking tax on the price paid for parking (in some US cities this has simply encouraged free car parks outside city centres)
- Introducing a Parking Space Levy where a charge is levied per space rather than per transaction (such as in many Australian cities including Sydney where funds from the PSL are used to support land public transport services)
- Introducing a Workplace Parking Levy - where the charge is applied only to workplace parking spaces and businesses must register all spaces

Each of these methods can have an impact on traffic levels. Propose to encourage restraint on parking provision by the control of the number of spaces and their type. Strategic Direction 5.11 of the KLCP 2020 relates to managing car parking and seeks to manage the supply and distribution of parking in city centre to enhance land public transport usage. The issue of parking charge increases is more problematic due to the extent of private ownership of car parks which might lead to consideration of a Sales levy (per transaction) or a levy per space. The former has been found in North America to encourage dispersal from city centres to suburban areas. Additionally, a proportion of users will not be subject to a parking charge as they have a space provided for them at their destination. Therefore, other road user charging mechanisms are more likely to have an impact on overall traffic levels. SPAD will undertake a feasibility study to assess the traffic restraint options more fully.

Alongside parking controls, the most effective policy to influence car mode share would be to develop a Road User Charging (RUC) scheme. RUC can take the following three basic forms, although for each of them there are a range of variations, from simple to complex:

- Area or zonal schemes - Vehicles using all roads within a designated area pay a licence fee, usually within designated times and sometimes related to vehicle type. The Singapore Area Licensing Scheme was an early example. The congestion charging scheme operating in Central London applies the same principle but does not vary charges by vehicle type
- Cordon pricing (or ‘toll rings’) - Charging points are located at all entries to a given area (often a city centre), usually with higher charges for large or polluting vehicles and at more congested times of day. Charges are incurred when vehicles pass a charging point. Oslo has been operating a toll ring since 1990 and the Stockholm scheme uses cordons
- Corridor or point charges - such as for a crossing location (bridge or tunnel) or toll road corridor
- Continuous charging systems - These charge vehicles for all travel within a defined area (such as a city). The charge can be based on the distance travelled or time spent travelling, or can involve a charging point on every road link. The complexity of these systems means that a fully automatic electronic charging system (‘electronic road pricing’ or ERP) must be used. Singapore is using an ERP system. This is not yet a truly continuous system, but may become one in the future. Alternative methods have been tested across the globe.

There are a now a number of RUC schemes introduced across the world (see Appendix A). The most successful have been in London and Singapore. In the former, a charge is levied on all journeys in Central London during the operating hours while in Singapore the user pays using an electronic road pricing for every cordon or screen line they pass.
In the context of Kuala Lumpur, the most likely approach would be to adopt an area charging scheme. However, the development of such a scheme needs to be thoroughly studied in terms of its feasibility, acceptability and effectiveness. At this stage it is too soon for the National Master Plan to indicate when road user charging might be needed for the Greater Kuala Lumpur/Klang Valley Region. This should investigate the spatial needs for a scheme by defining the most appropriate areas for such a policy. Many cities target areas of significant congestion or in need of environmental protection.

The timing of RUC schemes is crucial in that land public transport alternatives should be in place to allow users to change mode. Within the KLCP 2020, Strategic Direction 5.10 relates to restraining traffic within the city centre. This policy envisages restraining traffic within the city centre through congestion pricing to achieve an efficient use of road space. The document suggests 14 road pricing stations to establish a cordon within the MRR1. However, the policy does suggest that congestion pricing should only be introduced once all public transport is in place.

1.6 SPAD’s Role In Travel Demand Management

The SPAD Act 2010 (Act 714) outlines the function of SPAD. A key role is to advise on the development of plans and policies in respect of land public transport including those related to:

- The provision, development, improvement and expansion of land public transport in line with anticipated user demand
- The enhancement of safety, reliability and efficiency of land public transport services through the formulation, implementation and monitoring of minimum performance standards
- The promotion and improvement of co-ordination, integration and accessibility within the land public transport system
- The competition framework in respect of the supply of land public transport services
- TDM mechanisms

Therefore the Greater Kuala Lumpur/Klang Valley Master Plan needs to integrate the role of TDMP with the wider policy initiatives to improve bus, rail and taxi operations in the region.

In this chapter, a range of TDMP initiatives have been reviewed and the potential measures for consideration identified. The next chapter outlines the process of defining mode share targets within the National Master Plan as these set the benchmark against which the performance of the plan can be assessed.

**Key Conclusion**

A range of TDMP measures have been identified. They range from measures which influence the supply of public transport through to measures to influence demand.

Measures to influence demand can be through positive influence (improvements to land public transport or promoting walking and cycling) or through negatively influencing private vehicle usage through price or limiting vehicle usage.

TDMP measures need to be integrated into the Master Plan in order to support the increased land public transport ridership in the region.
2 LINKING TRAVEL DEMAND MANAGEMENT PLAN TO THE NATIONAL MASTER PLAN
Chapter 5: Travel Demand Management Plan

2 Linking Travel Demand Management Plan to the National Master Plan

2.1 Introduction

The previous chapter provided background to TDMP measures and provided an initial indication of the types of measures that might be suitable in Kuala Lumpur. This chapter identifies how the TDMP measures strengthen the Greater Kuala Lumpur/Klang Valley Master Plan for the Greater Kuala Lumpur/Klang Valley Region. The starting point is to define mode share targets for the region over time. The Greater Kuala Lumpur/Klang Valley Master Plan measures seek to achieve these targets with the support of TDMP. The chapter then examines how the performance of the plan would be enhanced by TDMP measures.

2.2 Defining Mode Share Targets

The performance of the Greater Kuala Lumpur/Klang Valley will need to be assessed using a variety of indicators based on travel time, accessibility and quality. The key indicator will be the mode share within the Greater Kuala Lumpur/Klang Valley Region.

‘Mode Share = percentage of journeys made by land public transport (including bus and rail)’

In defining the mode share targets these can be set for the region as a whole or for different spatial areas within the region. Incremental targets can be set for different areas so for example a city centre could have a higher target than outer suburban or rural areas. This reflects the supply of public transport. Targets can be set for different times of the day such as weekday peak periods, inter peak, or weekends.

As part of the NKRA, there has been monitoring of modal split within the Greater Kuala Lumpur/Klang Valley. This has shown that public transport modal share for the morning peak (7.00 am-9.00 am) has steadily fallen over the years from 34% in 1995 to 20% in 1999 (Based on the 1999 Study on Integrated Urban Transport Strategies for Environmental Improvement conducted by the Japan International Co-operation Agency (JICA), or more commonly known as the “JICA Study”) and 12% in 2008. As part of the NKRA the Prime Minister has set a national priority of delivering a 25% modal share for public transport in the Klang Valley by 2012 during AM peak periods. The Greater Kuala Lumpur/Klang Valley Master Plan needs to provide a mode share target for the longer term.

For the Greater Kuala Lumpur/Klang Valley Master Plan, a more disaggregated approach is proposed as shown in Figure 2.1. This recognises that a region is not homogenous reflecting differences in the level of public transport supply such as the presence of high capacity modes (rail corridors) as well as demands created due to land use which influence travel patterns. The measurement of modal share is assumed to follow a series of guiding principles:
• The overall measurement is that defined within the region as a whole.
• The principle Centre of Gravity should be defined as the Central Business Districts (CBD) of the major centre.
• The area reflecting the urban area should be defined as a key sector.
• Other Centres of Gravity should be defined reflecting other key centres within the region.
• Other key points reflecting important suburban centres should be defined.

The initial mode share targets within the Greater Kuala Lumpur/Klang Valley Master Plan are defined for these different areas. The mode share targets have been defined as:
• A base target which the strategy is expected to achieve.
• An aggressive target which sets an overall aim.

Table 2.1 shows the 20 years target for mode share within the different areas of the region. The base target for the Kuala Lumpur city centre is 50% by land public transport with an aggressive target of 60%. The base target for the area of Kuala Lumpur surrounding the CBD is 30% which reflects the lower density of land public transport network (aggressive target 50%). For the other important centres a base target of 35% is set (aggressive target 50%). For other key points a 20% base target is set (aggressive target 35%).

In the context of the Greater Kuala Lumpur/Klang Valley the monitoring is proposed:
• Within the region as a whole.
• CBD of Kuala Lumpur (area bounded by MRR1).
• Kuala Lumpur sector (area bounded by MRR2).
• Key centres of Shah Alam, Klang, Petaling Jaya and Putrajaya.
• Other key points such as Selayang, Serdang, Rawang, Puchong, Subang, Sunway and Kajang.

**Figure 2.1: Conceptual Model for Monitoring**
Table 2.1: Mode Share Targets for Greater Kuala Lumpur/ Klang Valley - 20 years to 2030

<table>
<thead>
<tr>
<th>Mode Share Targets</th>
<th>Base (%)</th>
<th>Aggressive (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Centre of Gravity 1 = Kuala Lumpur (within Middle Ring Road 1)</td>
<td>50</td>
<td>60</td>
</tr>
<tr>
<td>Surrounding 1 = Kuala Lumpur (within Middle Ring Road 2)</td>
<td>30</td>
<td>50</td>
</tr>
<tr>
<td>Centre of Gravity 2 = Shah Alam, Klang, Petaling Jaya, Putrajaya</td>
<td>35</td>
<td>50</td>
</tr>
<tr>
<td>Other Key points = Selayang, Serdang, Rawang, Puchong, Subang, Sunway and Kajang</td>
<td>20</td>
<td>25</td>
</tr>
</tbody>
</table>

Following publication, a more detailed technical assessment will be required of the engineering and operational feasibility. That stage will examine the exact alignment that should be adopted for new lines and the location of stations.

In order to identify these proposals an initial technical analysis was undertaken using the transport analysis tool to assess ridership and accessibility which sought to compare alternative options for individual corridors, or between providing new lines in alternative corridors.

As part of the Master Plan the proposed rail enhancements to the primary corridors include:

- Upgrade of the KTM service between Klang and Kuala Lumpur Sentral to provide a ‘metro’ style service
- Upgrade of the KTM service between Seremban and Rawang/ Batu Caves to provide a ‘metro’ style service
- Provision of a new MRT Circle line around Kuala Lumpur
- Provision of a new north west-south east MRT line to serve the city centre
- Development of an LRT line to operate between Kelana Jaya LRT, Shah Alam and Klang

The proposed rail enhancements to the secondary corridors include:

- Extension of the Kuala Lumpur Monorail
- Completion of the Putrajaya Monorail
- Development of an outer orbital route linking suburban centres

The BTP provides a series of initiatives to transform bus services in the Greater Kuala Lumpur/ Klang Valley region and include:

- Reform of the regulatory framework such that competitive tendering is adopted for routes within the region
- Introduction of bus priority measures to improve reliability
- Enforcement of bus priority measures
- Enhancement of BET corridors
- Introduction of BRT on secondary corridors
- Develop local and feeder bus services to support the changes in the rail network
Introduction of new vehicle fleet
Improved bus stop infrastructure
Improved information systems

Within the TTP, the proposed taxi enhancements include

- Enhanced quality standards to drivers and vehicles
- Introduction of appropriate taxi priority measures (e.g., taxi lanes, taxi stands, etc.)

### Urban Rail Elements

<table>
<thead>
<tr>
<th>Rationale</th>
<th>Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximise the potential use of the current asset</td>
<td>Upgrade KTM service to provide a “Metro” style service</td>
</tr>
<tr>
<td>Provide an expansion of capacity to cope with demands through extensions</td>
<td>Provision of a freight relief line</td>
</tr>
<tr>
<td>Construct new lines to meet demands &amp; future developments</td>
<td>Provision of new MRT Circle line around KL</td>
</tr>
<tr>
<td></td>
<td>Provision of a new North-west to South-east MRT line to serve the city centre</td>
</tr>
<tr>
<td></td>
<td>Development of an LRT line to operate between Kelana Jaya LRT, Shah Alam &amp; Klang</td>
</tr>
<tr>
<td></td>
<td>Extension of the KL Monorail</td>
</tr>
<tr>
<td></td>
<td>Completion of the Putrajaya Monorail</td>
</tr>
<tr>
<td></td>
<td>Development in the longer term of an outer orbital route linking suburban centres</td>
</tr>
</tbody>
</table>

### Bus

<table>
<thead>
<tr>
<th>Rationale</th>
<th>Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address current operational &amp; industry failings</td>
<td>Provide appropriate network to meet current demands</td>
</tr>
<tr>
<td>Enhance quality to increase use &amp; modal shift</td>
<td>Provide a network of BET &amp; for BRT services</td>
</tr>
<tr>
<td>Create integrated accessible network to cater for local &amp; regional needs</td>
<td>Provide mechanisms to enhance standards of vehicles &amp; infrastructure</td>
</tr>
<tr>
<td></td>
<td>Enable increased use of priority measures</td>
</tr>
<tr>
<td></td>
<td>Enable increased enforcement</td>
</tr>
<tr>
<td></td>
<td>Enable development of real time information systems &amp; journey planners</td>
</tr>
<tr>
<td></td>
<td>Develop integrated fares system</td>
</tr>
<tr>
<td></td>
<td>Provide Regulatory Regime to deliver planned accessible &amp; integrated network</td>
</tr>
</tbody>
</table>

### Taxi

<table>
<thead>
<tr>
<th>Rationale</th>
<th>Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address current operational issues</td>
<td>Develop new database of operators, vehicles &amp; drivers</td>
</tr>
<tr>
<td>Enhance quality to increase use</td>
<td>Provide mechanisms to enhance standards of vehicles &amp; drivers</td>
</tr>
<tr>
<td>Create improved brand with higher standards</td>
<td>Develop driver training programme</td>
</tr>
<tr>
<td></td>
<td>Enable use of priority measures as appropriate</td>
</tr>
</tbody>
</table>

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2.4 Performance of the Land Public Transport Master Plan

A series of transport analysis tools have been developed to assess the impact of land use and transport schemes on future travel demands, travel times and accessibility. The tools include:

- Land Use database which utilises the data provided by DBKL, Selangor UPEN and Perbadanan Putrajaya
- Trip generation model which uses the land use information to derive the forecast travel demands in the region

- Multi-modal transport model which derives the future travel patterns on the network in terms of flows, and travel times
- Accessibility model which shows the impact of travel times on access to locations within the study area for catchment area analysis
The key factors in the assessment of the future situation are travel demands, including travel patterns, travel times and accessibility and other considerations such as the network supply, land use and other known technical constraints. Land use data have been assembled from the local authorities to reflect future population and employment changes identified in Structure and Local Plans. The development of the Master Plan recognises the need for consistency between the needs of these plans and the requirements for public transport. Therefore the Master Plan has taken account of the location of major development areas which need to be served by public transport.

Data have been collated from the local authorities in relation to the Kuala Lumpur City Plan, the Selangor State Structure Plan, Putrajaya Master Plan and district local plans. The latest versions of the plans have been reviewed to identify their data, land use policies and development proposals. From this basis, the transport recommendations of the Master Plan are developed using an independent systematic and methodological approach as outlined in this chapter. This allows consistency and integration of the land public transport elements of the Master Plan with the development aspirations of the land use plans.

The population forecasts assume a capacity of 10 million people in the region with the largest growth forecast in Klang, Sepang and Putrajaya. This is a 59% increase in population compared to 2010. There are a number of major residential developments proposed within the land use plans which was incorporated into the LPTMP. The household size projections within the plans are forecast to drop further to 3.93 persons per household in 2020. This growth will maintain the pressure on the transport networks with increased demand for movement across the region.

Forecasts have been produced for the morning peak 2020 situation with those committed schemes and the MRT1. The forecast morning peak hour travel demands by all modes (private and public transport) in the region show large radial movements towards the central area of Kuala Lumpur. Demand for all modes crossing the MMR1 as forecast for 2020 shows strong flows in all the corridors with the highest demands being from the Petaling Jaya/Shah Alam/Klang corridor. Within the region there are also strong orbital demands in the suburban areas, particularly to areas such as Petaling Jaya and Shah Alam. The largest flows are in the Petaling Jaya area along corridors such as the North-South Expressway and the Damansara-Puchong Expressway (LDP) corridor. In addition to these flows between centres, there is a wide diversity of local movements within the suburban areas such as local movements within Shah Alam or Klang. Although lower than the radial demands into the centre of Kuala Lumpur, these demands require high quality land public transport access.

The transport analysis tools have been used to assess the performance of the Greater Kuala Lumpur/ Klang Valley Master Plan. The model runs have been undertaken to assess the impact of the land public transport improvements on their own before assessing what additional elements are required. The model includes stages to represent:

- Trip generation- based on the land use data- the number of morning peak trips are estimated for each origin and destination zone
- Trip distribution- provides a forecast of the travel patterns between origin and destination (the starting point for this process is a based year matrix to which incremental changes are applied
- Mode split- to assess the choice of mode (car or motorcycle against land public transport)
- Assignment- allocated trips to a highway and land public transport network in order to derive line loadings or highway flows

Initial indicative morning peak model runs have been undertaken to show the results of the Master Plan with limited TDM measures. Then a series of sensitivity tests have been undertaken to show the comparison:

- Base year (2011) model
- Forecast model assuming all the LPTMP measures in place as outlined in the URDP, BTP and TTP
• LPTMP with increased fuel prices applied to all trips- assuming a 20% increase in fuel price
• Increased parking charges
• RUC scheme in the centre of Kuala Lumpur of RM10 per trip across the cordon (assumed to be within MRR1)

Table 2.2 shows the modelled morning peak mode share achieved with each of the tests for the Greater Kuala Lumpur/Klang Valley region as a whole and for trips to/from centre Kuala Lumpur (defined as being within MRR1). The table shows that in the base the overall mode share for the region is 16% by land public transport. This compares with a modelled mode share on 38% by land public transport to the city centre of Kuala Lumpur in the morning peak. With the Master Plan measures outlined in the Subsidiary Plans the regional mode share is forecast to grow to 44% by 2030, and to 59% to/from the Kuala Lumpur city centre. With the inclusion of a road user charging scheme to the area within MRR1 the regional mode share increases to 47% but the mode share to the city centre shows a greater increase to 71% by land public transport. These tests provide an early indication that to achieve more aggressive targets may require the use of ‘stick’ measures to encourage a modal transfer from car to land public transport. The potential feasibility of a RUC scheme should be considered at some stage during the plan.

The journey time maps to the centre Kuala Lumpur in Figure 2.4 show a much greater area of lower land public transport travel times with the Master Plan compared to existing commitments. Accessibility has also been mapped with the LPTMP improvements and shown in Figure 2.5. This shows a greater area of improved accessibility including areas along the additional MRT lines and in the Klang Valley. This will assist the economic performance of the region.

**Table 2.2: Morning Peak Mode Share for Greater Kuala Lumpur/ Klang Valley**

<table>
<thead>
<tr>
<th>Test</th>
<th>Modelled land public transport Mode Share Trips to/from Kl City Centre(%)</th>
<th>Modelled land public transport Mode Share GKL/Klang Valley region(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base</td>
<td>38%</td>
<td>16%</td>
</tr>
<tr>
<td>PTMP</td>
<td>59%</td>
<td>44%</td>
</tr>
<tr>
<td>PTMP with 20% fuel price increase</td>
<td>60%</td>
<td>45%</td>
</tr>
<tr>
<td>PTMP with parking charge increase</td>
<td>63%</td>
<td>45%</td>
</tr>
<tr>
<td>PTMP with central area RUC</td>
<td>71%</td>
<td>47%</td>
</tr>
</tbody>
</table>

(Source: Greater Kuala Lumpur Model)
2.5 The Action Plan

Figure 2.6 outlines an Action Plan for the TDMP over the life of the plan. A key initiative will be the development of a Performance Monitoring Regime- the potential for which is outlined in the next chapter. Within the first 5 years of the Master Plan the focus is to introduce elements which aid the ‘first and last mile’ such as improvements to pedestrian and cycling networks. Bus priority schemes should also be encouraged as identified within the BTP. Travel information systems should be developed in a phased approach. This includes the provision of:

- Timetable and route information at bus stops and stations
- Paper based timetables and route information
- Web-based information systems
- Electronic journey planners on the web and smartphone (this can include stop information, location of buses, route planners, etc).
- Real time information systems

The timing and nature of mechanisms needed to influence the price of private vehicle motoring need to be assessed with a range of stakeholders including local authorities, MoT and MoF. A joint feasibility study could be undertaken in the early years of the plan to assess the feasibility, acceptability and impact of alternative charging options (including parking, taxation and road user charging). The feasibility study should identify the appropriate time to implement such a policy measure and the monitoring needed to identify implementation.
### Figure 2.6: Implementation Plan

<table>
<thead>
<tr>
<th></th>
<th>2011</th>
<th>2015</th>
<th>2010</th>
<th>2025</th>
<th>2030</th>
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<tbody>
<tr>
<td>Performance</td>
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<tr>
<td>Monitoring</td>
<td></td>
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<tr>
<td>Pedestrian</td>
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<tr>
<td>Improvements</td>
<td></td>
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<tr>
<td>Cycling</td>
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<tr>
<td>Improvements</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Information system</td>
<td></td>
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<tr>
<td>Bus Priority</td>
<td></td>
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<tr>
<td>Fuel Price Policy</td>
<td></td>
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<tr>
<td>Feasibility Study</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>On Charging Options</td>
<td></td>
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</tr>
<tr>
<td>Parking Charges</td>
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<tr>
<td>Parking Supply</td>
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<tr>
<td>Workplace Parking</td>
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<tr>
<td>Levy</td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>Road User Charging</td>
<td></td>
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</tr>
</tbody>
</table>
Key Conclusion

The TDMP identifies the methodology for deriving Mode Share targets for the Greater Kuala Lumpur/Klang Valley region.

Mode Share targets are defined for separate areas in the region reflecting their differing characteristics.

Base targets have been derived for each area alongside more aggressive targets that require stronger TDM measures.

A Master Plan strategy has been developed which seeks to maximise the potential use of the current assets and quality of service, provide expansion of existing capacity to cope with new demands and construct new lines to meet demands and future developments.
3 PERFORMANCE MONITORING
3 PERFORMANCE MONITORING

3.1 Introduction
Chapter 3 outlined the proposals in the Master Plan and the role of TDM in delivering the strategy. A key issue for the plan will be to monitor its effect. This section outlines the role of monitoring.

3.2 Key Performance Indicators
The performance of the LPTMP will need to be assessed using a variety of Key Performance Indicators (KPIs). These will relate to key indicators that reflect the objectives and sub-objectives of the Master Plan.

The objectives as defined within the National Land Public Transport Framework include:

- To increase economic competitiveness and growth.
- To improve health, safety and security.
- To improve land public transport access, connectivity and integration.
- To enable efficiency and affordability.
- To provide equality of opportunity.
- To improve the environment.

Sub-objectives are defined for each of these with a series of performance indicators as shown in Table 3.1. Each element will require a rolling programme of surveys to monitor performance. The aim is that there should be an Annual Transport Monitoring Report for the Greater Kuala Lumpur/Klang Valley region.

3.2.1 Economic Competitiveness
The aim of these indicators is to assess the effectiveness of public transport in terms of travel times and access to employment and key international links. For access to employment the key indicator is the number of jobs within 75 minutes of residents. This will require outputs from the transport model which will need to be updated annually to reflect the latest service patterns. From the model zone to zone travel times can be produced which are assessed using census data by zone to reflect the number of residents. Given that the census data is available every 10 years it is proposed that ‘base year’ data are updated using information from local authorities on the number of completions of household units during the intervening years.

The access to international links will be measured by the mode share and travel times by public transport to KLIA. Mode share can be assessed using a survey of employees and departing passengers at KLIA. The passenger survey should cover aspects such as:

- Number in the party
- Origin of journey to access KLIA
- Mode of access to KLIA (bus, rail, taxi, hire car, car parked at airport, kiss and fly)
- Time of day
- Destination of flight
- User information (age, sex, household income)
<table>
<thead>
<tr>
<th>Objective</th>
<th>Sub Objective</th>
<th>Indicator</th>
<th>Survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economic Competitiveness</td>
<td>Access to Jobs</td>
<td>Number of people within 75 min.</td>
<td>use of transport model- validation of model journey times using surveys</td>
</tr>
<tr>
<td></td>
<td>Access to International Links</td>
<td>Mode share to KLIA</td>
<td>survey of passengers and employees at KLIA</td>
</tr>
<tr>
<td></td>
<td>Access to International Links</td>
<td>Travel times by bus and rail to KLIA</td>
<td>Journey time surveys for key routes</td>
</tr>
<tr>
<td></td>
<td>Journey times</td>
<td>Travel times by car</td>
<td>Journey time surveys for key routes</td>
</tr>
<tr>
<td></td>
<td>Journey times</td>
<td>Travel times by bus</td>
<td>Journey time surveys for key routes</td>
</tr>
<tr>
<td></td>
<td>Journey times</td>
<td>Travel times by rail</td>
<td>Journey time surveys for key routes</td>
</tr>
<tr>
<td></td>
<td>Capacity</td>
<td>PT capacity</td>
<td>Assessment of capacity of system</td>
</tr>
<tr>
<td></td>
<td>Capacity</td>
<td>Rail ridership</td>
<td>Boarding and alighting counts at stations</td>
</tr>
<tr>
<td></td>
<td>Capacity</td>
<td>Bus ridership</td>
<td>Information from bus operators and boarding and alighting counts on key routes/locations</td>
</tr>
<tr>
<td>Health Safety and Security</td>
<td>Personal Security</td>
<td>Incidents on land public transport</td>
<td>Reported incidents/ crimes by mode</td>
</tr>
<tr>
<td></td>
<td>Road accidents</td>
<td>Number of road accidents</td>
<td>Reported accidents</td>
</tr>
<tr>
<td></td>
<td>Encourage healthy lifestyles</td>
<td>Mode share</td>
<td>Rolling household surveys</td>
</tr>
<tr>
<td>Land Public Transport Access, Connectivity and Integration</td>
<td>Access to land public transport</td>
<td>Number of people living within 400m of service</td>
<td>Network review</td>
</tr>
<tr>
<td></td>
<td>Quality of Journey</td>
<td>Rail Quality</td>
<td>Customer Satisfaction Surveys</td>
</tr>
<tr>
<td></td>
<td>Quality of Journey</td>
<td>Bus Quality</td>
<td>Customer Satisfaction Surveys</td>
</tr>
<tr>
<td></td>
<td>Quality of Journey</td>
<td>Taxi Quality</td>
<td>Customer Satisfaction Surveys</td>
</tr>
<tr>
<td></td>
<td>Integration with land use</td>
<td>Developer contributions</td>
<td>Volume of developer contributions</td>
</tr>
<tr>
<td>Efficiency</td>
<td>Reliability</td>
<td>Bus reliability</td>
<td>% of vehicle kilometres operated</td>
</tr>
<tr>
<td></td>
<td>Reliability</td>
<td>Rail reliability</td>
<td>% of vehicle kilometres operated</td>
</tr>
<tr>
<td></td>
<td>Reliability</td>
<td>Bus reliability</td>
<td>% of buses within 10 mins of scheduled time</td>
</tr>
<tr>
<td></td>
<td>Reliability</td>
<td>Rail reliability</td>
<td>% of rail services within 10 mins of scheduled time</td>
</tr>
<tr>
<td></td>
<td>Land Public Transport Mode Share</td>
<td>Mode Share Kuala Lumpur CBD</td>
<td>Traffic surveys and pedestrian surveys across MRR1</td>
</tr>
<tr>
<td></td>
<td>Land Public Transport Mode Share</td>
<td>Mode Share outside Kuala Lumpur CBD</td>
<td>Rolling Household survey, traffic counts, bus and rail occupancy surveys</td>
</tr>
<tr>
<td></td>
<td>Land Public Transport Mode Share</td>
<td>Mode Share Key centres</td>
<td>Rolling Household survey, traffic counts, bus and rail occupancy surveys</td>
</tr>
<tr>
<td></td>
<td>Land Public Transport Mode Share</td>
<td>Mode Share other key points</td>
<td>Rolling Household survey, traffic counts, bus and rail occupancy surveys</td>
</tr>
<tr>
<td></td>
<td>Value for money</td>
<td>Spend on LPTMP</td>
<td>Monitor spending progress against budget</td>
</tr>
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<td>Deliverability</td>
<td>LPTMP elements introduced</td>
<td>Monitor progress of LPTMP elements</td>
</tr>
<tr>
<td>Equality of Opportunity</td>
<td>Access for All</td>
<td>Access indicator</td>
<td>Composite indicator reflecting issues such as step free stations, accessible bus stops. Assessed through an Audit.</td>
</tr>
<tr>
<td></td>
<td>Affordable Pricing</td>
<td>Fare level</td>
<td>Monitor fare as % of household income-household survey</td>
</tr>
<tr>
<td>Environment</td>
<td>Air Quality</td>
<td>CO emissions</td>
<td>Veh-kms</td>
</tr>
</tbody>
</table>
The airport employee survey should cover aspects such as:

- Origin of journey to access KLIA
- Mode of access to KLIA (bus, rail, taxi, motorcycle, car parked at airport, kiss and fly)
- Time of day
- User information (age, sex, job at airport, household income)

In order to assess travel times to the airport a series of journey time surveys should be undertaken by rail, bus and car (the latter require surveys from selected locations to the airport). For the bus survey use could be made of GPS units on the vehicle to monitor travel times. For private vehicle a number of journey time observations would be required on selected routes.

Similarly journey times in the Greater Kuala Lumpur/Klang Valley region could be monitored for a series of defined routes. These might include a series of surveys on key corridors to the centre of Kuala Lumpur as well as movements to key outer centres such as between Klang and Shah Alam or to Putrajaya. The number of routes should be defined in a monitoring programme definition. Use should be made of rail timetables to assess rail time. For the bus survey use could be made of GPS units on the vehicle to monitor travel times. For private vehicle a number of journey time observations would be required on selected routes.

Public Transport capacity should reflect the level of service on the network. The capacity can be defined by the frequency of trains and their seating and standing capacity. The collection of rail and bus ridership data from operators can be used to assess the level of overcrowding on the land public transport network to aid the evaluation of passenger comfort.

3.2.2 Health, Safety and Security

Personal safety should be monitored through the number of reported incidents on the land public transport network as well as being assessed through customer satisfaction surveys to assess the perception of safety on the system. A rolling programme of surveys should be undertaken annually to assess any concerns. Use can also be made of any feedback to the SPAD forum.

Accidents can be measured through the number of reported accidents - either by road (including bus and taxi) or by rail. Accidents should be classified according to those involving fatalities, serious injury or others.

3.2.3 Land Public Transport Access, Connectivity and Integration

Access to the land public transport system can be monitored through the number of people living within 400 metres of a bus or rail network. Given that the census data is available every 10 years it is proposed that ‘base year’ data are updated using information from local authorities on the number of completions of household units during the intervening years. The population data can be compared against the land public transport supply data to assess the catchments served.

Quality of service should be monitored through a rolling programme of customer satisfaction surveys. Separate surveys should be undertaken for each mode to identify the users' satisfaction with different elements of the land public transport service. For example, a taxi survey might assess the customers’ reaction to issues such as:

- Charge according to the meter
- Willingness to go to destination
- Service availability
- Call service
- User’s safety
- Taxi condition
- Drivers’ attitude

The integration with land use might assess the level of developer contributions obtained from developers and the percentage spent on public transport.
3.2.4 Efficiency

A key feature of the Master Plan will be to introduce some form of performance monitoring of public services in the region. For bus and rail this will need to assess the proposed vehicle kilometres to be operated during the year in comparison with the actual vehicle kilometres served. This could be monitored on a monthly basis to assess trends by route and operator. The difference between the two values will give an indication of the service reliability and those operators who perform poorly should be penalised.

For rail in particular, a performance indicator should be the number of trains arriving within 10 minutes of the scheduled time. This should take into account any cancellations as well as those trains which are delayed.

Efficiency is also measured by the land public transport mode share. As outlined earlier this should reflect the mode shares in different parts of the region including:

- Within the region as a whole
- The CBD of Kuala Lumpur (defined as the area bounded by MRR1)
- A Kuala Lumpur sector reflecting the area within MRR2
- For the key centres of Shah Alam, Klang, Petaling Jaya and Putrajaya
- Other key points such as Selayang, Serdang, Rawang, Puchong, Subang/Sunway/
- Kajang

The approach to assessing mode share is through a range of survey methods. These should include:

- Traffic counts across defined cordons and screenlines such as MRR1, MRR2
- Rail ridership estimation across the same cordons and screenlines from operator data
- Bus ridership estimation across the same cordons and screenlines from operator data and observation surveys
- A rolling programme of household surveys

The rolling programme of household surveys should assess for a sample of households across the region information for a variety of aspects including:

- Household information- including numbers in the household, their age, car and motor cycle ownership
- Person information- including the number of employed residents or school pupils
- Travel information- the completion of a travel diary to identify the number and location of journeys undertaken during the day

The travel diaries will be used to provide mode share estimates for all modes including public transport, private vehicle, and motor cycle. Where possible the survey should identify the journey purpose and the time of day for the journey. This travel information will supplement information obtained from the census journey to work survey. It is proposed that the rolling programme is undertaken each year with an appropriate sample to give statistically significant results.

3.2.5 Equality of Opportunity

An Access indicator can be derived which reflects the ease of access to the transport system. Transport for London (TfL) for example uses a composite indicator reflecting accessible bus stops, accessible crossings, and step free stations. This will require an inventory to be undertaken to assess facilities.

The household survey should be able to provide an indication of household income and the amount spent on transport.
3.2.6 Environment

The traffic counts, household surveys and model outputs will allow an assessment of the amount of vehicle kilometres travelled in the region. From this an estimate of emissions will be possible using international best practice.

Key Conclusion

The Master Plan should be developed under a Performance Monitoring Regime to track the performance of the elements.

Key Performance Indicators should be mapped against the National land public transport master Plan objectives to allow a survey programme to be defined.

A series of indicators have been proposed alongside potential survey methods.
4 SUMMARY
Chapter 5: Travel Demand Management Plan

4 SUMMARY

SPAD has developed the National Land Public Transport Master Plan to set out the vision and direction for land public transport in Malaysia. The purpose is to develop a long term programme to address the current deterioration in land public transport with plans to execute high impact and effective delivery initiatives for a 20-years sustainable national land public transport service.

The National Land Public Transport Master Plan outlines the National Land Public Transport Policy which provides guidance and direction towards developing the National Master Plan. Included in the National Land Public Transport Master Plan is also a Planning Toolkit which provides the guidance on the methodology for setting objectives, plan development, identification of policy measures and assessments of solutions. The Planning Toolkit facilitates the development of Regional Master Plan and enables interfacing with State-specific plans and land use policies.

The first Regional Master Plan developed by SPAD is for the Greater Kuala Lumpur/ Klang Valley region. The TDMP is one of six Subsidiary Plans of the Greater Kuala Lumpur/Klang Valley Master Plan, and relates to travel demand management in the region. Together these six plans provide an integrated land public transport plan for the Greater Kuala Lumpur/Klang Valley region.

In order to aid the development of the Greater Kuala Lumpur/Klang Valley Master Plan, a series of Guiding Principles have been developed examining issues related to accessibility, capacity, social inclusion and the environment.

The building blocks for the Master Plan are outlined in the Subsidiary Plans (BTP, TTP, and URDP). However in many circumstances there is a need for demand led shifts which seek to increase the usage of land public transport within the existing supply levels or in tandem with supply based measures. A range of TDM measures have been reviewed in the production of this plan to assess those with potential in Greater Kuala Lumpur/Klang Valley.

For the Demand side policy levers, there are two basic approaches to achieving a demand shift to public transport from private transport. The first are termed ‘pull’ initiatives (sometimes also referred to as ‘Carrots’) which seek to provide a positive influence on demand through measures such as

- Integrated ticketing
- Encouraging flexible working hours and telecommuting in order to spread the peak period travel demands
- Travel Planning Information
- Advertising Campaigns
- Developing priority measures for bus, taxi and non-motorised modes
- Workplace and School Travel Plans

The second set of approaches are termed ‘push’ initiatives (sometimes referred to as ‘Sticks’) which seek to provide a negative influence on demand through measures such as

- Vehicle use restrictions
- Fuel and taxation
- Parking controls
- RUC
The selection of the TDM measure often reflects the priority of the objectives being considered. Among the common objectives for TDM include:

- The reduction of congestion by measures aimed at reducing peak period demands.
- Achieving a behavioural change to encourage a modal transfer from private vehicles to public transport.
- Increasing the efficiency of the network such that the focus is on the movement of people rather than private vehicles.
- Reducing carbon emissions so as to have a positive impact on the environment.
- Generating revenue which can be used to support public transport policies and services.

A range of TDM measures have been incorporated into the Master Plan.

In order to support the Master Plan the following measures are needed:

- Travel Planning Information, including the development of Workplace and School Travel Plans
- Advertising Campaigns
- Developing priority measures for bus, taxi and non-motorised modes
- Integrated ticketing
- Encouraging flexible working hours and telecommuting in order to spread the peak period travel demands
- Parking controls
- Fuel price policy
- Vehicle use restrictions
- RUC

The timing of RUC schemes is crucial in that land public transport alternatives should be in place to allow users to change mode. Within the Kuala Lumpur City Plan, Strategic Direction 5.10 relates to restraining traffic within the City Centre. This policy envisages restraining traffic within City Centre through Congestion Pricing to achieve an efficient use of road space. The document suggests 14 road pricing stations to establish a cordon within the MRR1. However, the policy does suggest that congestion pricing should only be introduced once all public transport is in place.

At this stage it is too soon for the Master Plan to indicate when road user charging might be needed for the Greater Kuala Lumpur/Klang Valley region. The master plan recommends that RUC should be investigated further through a feasibility study with a view to determining the type of scheme (in terms of type, area, and charge).

The TDMP has defined a series of mode share targets. These recognise that the region is not homogenous as there will be differences in the level of public transport supply reflecting the presence of high capacity modes such as rail corridors as well demands created due to land use which influence travel patterns. The measurement of modal share is assumed to follow a series of guiding principles:

- The overall measurement is that defined within the region as a whole
- The principle Centre of Gravity should be defined as the Central Business Districts of the major centre
- The area reflecting the urban area should be defined as a key sector
- Other Centres of Gravity should be defined reflecting other key centres within the region
- Other key points reflecting important suburban centres should be defined

In the context of the Greater Kuala Lumpur/Klang Valley the monitoring is proposed:

- Within the region as a whole
- CBD of Kuala Lumpur (area bounded by MRR1)
- Kuala Lumpur sector (area bounded by MRR2)
- Key centres of Shah Alam, Klang, Petaling Jaya and Putrajaya
- Other key points such as Selayang, Serdang, Rawang, Puchong, Subang and Kajang
Appendix A

TDM Measures

A.1
Introduction

This chapter outlines the different types of TDM measure that have used. These include the ‘pull’ and ‘push’ initiatives. The (‘Pull’) measures include

• Improvements to Public Transport.
• Walking and Cycling.
• Car Sharing and Car Pooling.
• The ‘Push’ measures (or sticks) include
  • Limits on vehicle usage.
  • Fuel and Taxation policy.
  • Parking Controls.
  • Workplace parking levies.
  • Area user charges.
  • Cordon charges.
  • Distance based charging.

Within this chapter we outline the rationale behind each of the approaches and provide international examples to demonstrate how and where they have been used. The chapter then provides a link to Chapter 4 which assess the suitable measures for Greater Kuala Lumpur/Klang Valley have taken account of the transit gaps and the future land use patterns identified by the local authorities.

A.2
TDM Measures - ‘Pull’ Initiatives - Improving Land Public Transport

The initial consideration in TDM is typically to seek measures to encourage land public transport modal share by the enhancement of land public transport themselves. In essence this is one of the key planks of the Master Plan and is reflected in each of the Subsidiary Plans developed for the Greater Kuala Lumpur/Klang Valley Master Plan.

These approaches include the supply initiatives to increase capacity such as:

• Expanding existing services (e.g. providing longer train sets reflected in the UDRP- or the provision of feeder bus services in the BTP).
• Extending the coverage of the existing land public transport network (reflected in the URDP through the extensions to existing lines).
• Improving service quality (reflected in each of the URDP, BTP and TTP) to encourage greater use.
• Developing new land public transport systems (such as the MRT lines in the URDP or the BRT corridors in the TTP).

The TDM measures related to encouraging demand through aspects such as:

• Improved interchange between modes (reflected in the Terminals Plan).
• Ticket Integration.
• Land Public Transport Information Systems
• Land Public Transport Marketing
A.3
Improving Walking and Cycling

These are measures to encourage walking and cycling through infrastructure improvements (better walkways, cycle lanes, cycle parking) as well as measures in the workplace such as cycle parking, shower facilities etc. The rationale is to encourage greater use of non-motorised modes at the expense of private vehicle usage. The types of approach are outlined in Table A.1.

The improvements in pedestrian infrastructure seek to provide continuous walkways for pedestrians segregated from traffic and parked vehicles. These facilities may be covered to protect pedestrians from extreme weather conditions (such as heavy rains in tropical countries or the case of some North American Cities these can be under-cover to avoid the harshness of the winter). The facilities that are provided should have good signage to indicate pedestrian routes and be illuminated to provide a safe route at night. These improvements are typically targeted at shorter distance journeys such as journeys to school or shops in order to reduce the reliance on the private vehicle for these journeys. They can be accompanied by travel marketing and planning campaigns within the schools themselves (Such as Safe Routes to Schools Initiatives). The pedestrian infrastructure may include improvements for crossing facilities, either at-grade through the use of signal controlled facilities or grade separated using bridges or subways.

Many western cities have sought to provide improved cycling infrastructure through the provision of dedicated cycle ways and cycle lanes to encourage cycle use. These are often supported by the provision of cycle parking facilities in city centres as well as encouraging workplaces to provide parking and facilities such as showers and changing rooms in the workplace. A number of cities have introduced cycle-hire schemes (such as London, Paris and Montreal) to allow people to rent bicycles for a short period. The Paris scheme (Vélib) is a large-scale public bicycle sharing system launched in 2007. The system has expanded to over 20,000 bicycles and 1,202 bike stations all over the French capital and some surrounding municipalities.

The London scheme was introduced in 2010 with 5,000 bicycles and 315 docking stations available in central London at the launch. Initially, usage of the scheme’s

<table>
<thead>
<tr>
<th>APPROACH</th>
<th>DESCRIPTION</th>
<th>KEY CONSIDERATION</th>
<th>BEST PRACTICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improve Pedestrian Infrastructure</td>
<td>Provide continuous walkways, Provide covered walkways, Provide crossing facilities at-grade or grade separated, Provide signage, Provide lighting</td>
<td>Improvements targeted at shorter journeys (such as to school, shops) Important for ‘first and last mile’ of a land public transport journey Provide safe routes</td>
<td>Many cities across the globe</td>
</tr>
<tr>
<td>Improve Cycling Infrastructure</td>
<td>Provide designated cycle ways Advanced Cycle Stop Lines Cycle Parking Cycle Hire Schemes Workplace facilities</td>
<td>Improvements targeted at short-medium journeys Important for ‘first and last mile’ of a land public transport journey Provide safe routes</td>
<td>Many Western European Cities (particular examples, Amsterdam, Copenhagen) London and Paris Cycle Hire Schemes</td>
</tr>
<tr>
<td>Information</td>
<td>Maps of pedestrian and cycle routes Promotion in schools and workplaces</td>
<td>Promotion of non - motorised modes</td>
<td>London (legible London scheme)</td>
</tr>
</tbody>
</table>
bicycles required registration and membership fee to be paid up front for an electronic key, but the scheme was later opened to casual users while bicycles may also be hired using a credit or debit card. Bixi is a public bicycle sharing system launched in Montreal where the system has expanded to 5,000 bicycles and 400 stations. Other cities with cycle schemes include Ottawa, Melbourne, Minneapolis (MN), and Washington, D.C.

Such initiatives are often backed up by information and marketing to identify routes for pedestrians and cyclists, locations of key facilities and promotion of the benefits of walking and cycling. Legible London for example is a series of way finder posts in Central London with the aim of making London a friendly, easy place to walk around. The posts provide maps of the local area and directions to key locations.

The key factors for these schemes are that they are:
- schemes used to promote environmental and health benefits;
- designed to ensure the safety of the user;
- important considerations for the ‘first and last mile’ of a public transport journey- this is reflected in more detail in the Interchange and Integration Plan;
- important considerations for new developments to ensure sustainability and land public transport access - also considered in the Land Use Plan; and
- support of local authorities and businesses.

A.4 Car Pooling and Car Sharing

These are measures aimed at encouraging increased vehicle occupancy to reduce private vehicle usage. The types of approach are outlined in Table A.2. Car Pooling is the use of shared car for a specific journey, often by people who each have a car but travel together to save costs. These carpooling schemes are often used as part of Workplace Travel Planning Schemes. Car Sharing is used as car rental where people rent cars for short periods of time.

Car Pooling schemes have been promoted in many cities across the globe. The approach is seen as a more environmentally friendly and sustainable way to travel as sharing journeys reduces carbon emissions, traffic on the roads, and the need for parking spaces at the workplace. Users seek to reduce the costs of car travel by sharing journey expenses such as fuel, and tolls, between the people travelling. Often Car Pooling Schemes are used in the workplace where employees can match journey details, often on a company website to agree costs and times of journeys. They are supported by use of internet or mobile phone applications for arranging for car pooling.

Car sharing (also known in the UK as car clubs) is a system of car rental where people rent cars for short periods of time, often by the hour and as such are attractive to customers who make only occasional use of a vehicle. The organization renting the cars may be a commercial business or the users may be organized as a democratically controlled company (for example Zipcar has the largest operation in cities with 4,400 locations and 400,000 members), public agency, cooperative, ad hoc grouping. Today there are more than one thousand cities with car sharing schemes. Car Sharing scheme requires a fleet of cars for use and a range of technology options from simple manual systems to increasingly complex computer-based systems with supporting software packages that handle a growing array of back office functions.

Car Sharing and Car Pooling can be important considerations for new developments to ensure sustainability and land public transport access - (this is also considered in the Land Use Plan).

In many North American cities a further encourage to increased vehicle occupancy is the provision of High Occupancy Vehicle Lanes (HOV) on major freeways. In Australia and New Zealand these are called Transit Lanes. HOV lanes may be segregated from other lanes by barriers or be segregated by paint. In some locations the lanes may operate tidally s they reversed in different time periods. The latter need to be supported by information systems to advise on the direction of travel. A key requirement for the use of HOV lanes is the supporting enforcement system.


### Table A.2: Car Sharing and Car Pooling

<table>
<thead>
<tr>
<th>APPROACH</th>
<th>DESCRIPTION</th>
<th>KEY CONSIDERATION</th>
<th>BEST PRACTICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Car Pooling</td>
<td>The shared use of a car for a specific journey, often by people who each have</td>
<td>Trying to reduce number of vehicles on the road by</td>
<td>Many cities across the globe</td>
</tr>
<tr>
<td></td>
<td>a car but travel together to save costs.</td>
<td>pooling</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Often used for commuting as part of Workplace Travel Planning Schemes</td>
<td>Target Increased vehicle occupancy</td>
<td></td>
</tr>
<tr>
<td>Car Sharing</td>
<td>Used as car rental where people rent cars for short periods of time</td>
<td>Provide users with access to a vehicle but without the</td>
<td>Over 1000 across the globe (source World Car share</td>
</tr>
<tr>
<td></td>
<td></td>
<td>need to purchase</td>
<td>consortium). For example Zipcar has the largest</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>operation in cities with 4,400 locations and 400,000</td>
</tr>
<tr>
<td>Vehicle Occupancy</td>
<td>Provision of HOV lanes</td>
<td>Re-allocating road space based on occupancy needs</td>
<td>Many North American Cities</td>
</tr>
<tr>
<td>Lanes</td>
<td></td>
<td>enforcement</td>
<td></td>
</tr>
</tbody>
</table>

#### A.5

**TDM Measures- Push Initiatives- Limits on Vehicle Usage**

Measures to limit vehicle use might include the reallocation of traffic lanes for land public transport services through to complete restrictions on vehicle movement (See Table A.3).

Measures to limit vehicle usage place greater reliance on road space for land public transport users at the expense of the private vehicle. Such measures might include the provision of bus lanes by reducing the number of lanes for private vehicles. Bus lanes give priority to buses and cut down on journey times where roads are congested with other traffic. A bus lane may not necessarily very long, as it may only be used to bypass a single congestion point such as a junction. Alternatively some cities have built large stretches of bus lanes, in some occasions segregated from traffic.

These are often referred to as bus ways. The bus lanes may be with-flow (i.e. in the direction of travel) or contra-flow (against the traffic flow).

Many cities across the world have introduced bus lanes. Some examples are shown in Table A.4. The Bus Transformation Plan examines the potential for bus lanes in the Greater Kuala Lumpur/Klang Valley region.

Car free areas range in scale from new development areas specifically designed to be traffic free through to pedestrian zones in city centres. Car free developments are typically residential or mixed use developments which are built as new and:

- Normally provide a traffic free immediate environment
- Offer no parking or limited parking separated from the residence
- Designed to enable residents to live without owning a car
By contrast most pedestrianised city, town and district centres have been retro-fitted around the existing built environment. The objective of these zones is to provide traffic free commercial space to boost local economic activity or provide protection for environmentally sensitive areas. The largest example in Europe for example is Groningen with a city centre population of 16,500.

An alternative approach to restricting car use is to limit the days in which vehicles can enter a city. For example, to improve Athens’s traffic and pollution problem, cars with registration plates ending in an odd number are allowed in only on even-numbered days. The scheme applies on Monday to Friday only although the effectiveness is undermined by double vehicle ownership and exemptions.

Traffic restraint schemes based on number plates are also operational in Manila, Mexico city, Bogota, Athens and various cities in Italy. Mexico City uses a system where different plates are allowed in on different days of the week. One day a week a vehicle with a plate ending with a choice of 2 numbers is not allowed into the city. This scheme was promoted to reduce air pollution.

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**Table A.3: Measures to Limit Car Use**

<table>
<thead>
<tr>
<th>APPROACH</th>
<th>DESCRIPTION</th>
<th>KEY CONSIDERATION</th>
<th>BEST PRACTICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bus Lanes</td>
<td>Re-allocating road space to public transport and taxis</td>
<td>Trying to encourage modal transfer and improve reliability for public transport</td>
<td>Many cities across the globe</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Often used for peak periods</td>
<td></td>
</tr>
<tr>
<td>Car Free zones</td>
<td>Often used in city centres to restrict car access</td>
<td>Provide environmental benefits in city centres</td>
<td>Many cities across the globe</td>
</tr>
<tr>
<td>Licence Based Traffic Scheme</td>
<td>Allows alternate access to an area based on the licence plate- for example even numbered plates one day, odd numbered plates another</td>
<td>Re-allocating road space based on occupancy</td>
<td>Athens, Mexico City</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Needs enforcement</td>
<td></td>
</tr>
</tbody>
</table>

---

**Table A.4: International Examples of Bus Lane Provision**

<table>
<thead>
<tr>
<th>City</th>
<th>Population (mill)</th>
<th>Bus Fleet</th>
<th>Population per Bus</th>
<th>Bus Lane (km)</th>
<th>Buses per 1km of Bus lane</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sydney</td>
<td>4.3</td>
<td>1,900</td>
<td>2,260</td>
<td>90</td>
<td>21</td>
</tr>
<tr>
<td>Santiago</td>
<td>6.5</td>
<td>4,600</td>
<td>1,400</td>
<td>200</td>
<td>23</td>
</tr>
<tr>
<td>London</td>
<td>7.5</td>
<td>6,800</td>
<td>1,100</td>
<td>240</td>
<td>28</td>
</tr>
<tr>
<td>Singapore</td>
<td>4.5</td>
<td>3,775</td>
<td>1,200</td>
<td>155</td>
<td>29</td>
</tr>
<tr>
<td>Seoul</td>
<td>10.0</td>
<td>7,000</td>
<td>1,428</td>
<td>282</td>
<td>32</td>
</tr>
<tr>
<td>Madrid</td>
<td>5.5</td>
<td>2,022</td>
<td>2,720</td>
<td>50</td>
<td>40</td>
</tr>
<tr>
<td>Bogota</td>
<td>6.7</td>
<td>1,080</td>
<td>6,200</td>
<td>84</td>
<td>45</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>6.8</td>
<td>5,885</td>
<td>1,155</td>
<td>22</td>
<td>267</td>
</tr>
</tbody>
</table>
A.6 Fuel and Taxation

In many countries fuel and taxation policy is used to reduce private vehicle usage (see Table A.5). With a fuel price escalator governments seek to increase the price of fuel above the rate of inflation. This is a measure to increase price so as to reduce the distance travelled. In the UK this was used from 1993 and set at 3% above the rate of inflation. This was later increased to 5% and then 6% until 1999. Recently UK budgets have also sought to increase fuel prices above inflation. The key consideration in relation to this policy is that it affects all motorists and in particular, penalises motorists in areas with little land public transport choice.

Alternative government policies often seek to increase the taxation on new cars or the annual excise duty that is levied on cars. The key considerations for these schemes are the political acceptability of increasing the costs of motoring as well as the issue of penalising those motorists with little land public transport choice, particularly in rural areas.

Table A.5: Measures to influence Car Use by Fuel and Taxation Policy

<table>
<thead>
<tr>
<th>APPROACH</th>
<th>DESCRIPTION</th>
<th>KEY CONSIDERATION</th>
<th>BEST PRACTICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuel Price Escalator</td>
<td>Governments seek to increase the price of fuel</td>
<td>Affects all motorists based on their usage of vehicles</td>
<td>Used in UK from 1993 and set at an annual increase of 3% ahead of inflation, later rising to 5% and then 6% until 1999. Recent UK budgets have also sought to increase the rate of increase above inflation</td>
</tr>
<tr>
<td></td>
<td>above the rate of inflation</td>
<td>Penalises those motorists with little land public transport choice most</td>
<td></td>
</tr>
<tr>
<td>New Car Taxation</td>
<td>Governments seek to increase the price of new</td>
<td>Often used to protect a local car industry</td>
<td>Used worldwide</td>
</tr>
<tr>
<td></td>
<td>cars to moderate purchase of new vehicles</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annual Car Tax (Vehicle</td>
<td>Governments seek to increase the annual taxation</td>
<td>Penalties those motorists with little land public transport choice most</td>
<td>Used worldwide UK system related to vehicle type based on CO2 emissions</td>
</tr>
<tr>
<td>Excise Duty)</td>
<td>on vehicles to moderate vehicle ownership</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A.7 Parking Controls

A more targeted approach to increasing private vehicle costs is to apply controls on parking, either through limiting the supply (such as reducing the number of spaces or re-allocating between long stay and short stay users) or by pricing (see Table A.6). Many cities have introduced innovative parking policies to encourage reductions in car use, and provide environmental gains (see Institute for Transportation and Development Policy, Europe’s Parking U-Turn: From Accommodation to Regulation).

Parking reforms have proved to be more popular with city authorities than congestion charging. In Paris, the on-street parking supply has been reduced by more than 9% since 2003, and of the remaining stock, 95% is paid parking. The result, along with other transport infrastructure improvements, has been a 13% decrease in driving. Other examples of limiting the number of parking spaces include the central areas of Zurich and Hamburg’s. However, in many cases the ability to limit parking and encourage modal transfer is made easier by the provision of a significant public transport network.
Where the parking stock is operated by local councils, the revenues generated from parking can be re-invested in public transport. For example, revenue from parking in Barcelona subsidises the city’s public bike system.

Parking controls in developments are increasingly linked to public transport. Examples include cities such as Amsterdam, Paris, Zurich and Strasbourg limit how much parking is allowed in new developments based on how far it is to walk to a bus, tram or metro stop. The potential for these in the GKL/Klang Valley region is examined in the Land Use Plan.

Alternative approaches where there is a greater supply of private operators are to impose a sales tax on commercial parking transactions. This requires a commercial parking operator to maintain reliable records of revenues or transactions. The issue here is that some commercial parking operators may underreport their revenues to reduce their tax payments but examples include the city of San Francisco where operators use specific revenue control systems that provide a receipt to users and securely record transactions for auditing.

The parking tax tends to reduce the supply of priced (user paid) parking in areas where a significant portion of parking is provided by commercial operators. Such a tax applies primarily in downtowns and other major urban centres, where more parking is priced, and not in suburbs where most parking is provided free. As a result, it makes urban centres relatively less competitive compared with suburban locations where parking is unpriced. In this way, commercial parking taxes can increase total parking subsidies and sprawl, contradicting other planning objectives.

A Parking Space Levy (PSL) is an approach where the charge is levied per space rather than by parking transaction. Many Australian Cities adopt this approach as part of their transport strategies to discourage car use in major commercial centres, encourage the use of public transport and to improve air quality.

In Sydney the PSL commenced in 1992 with the objective of the Parking Space Levy Act (2009) “is to discourage car use in leviable districts by imposing a levy on parking spaces (including parking spaces in parking stations), and by using the revenue to encourage the

Table A.6: Measures to influence Car Use by Parking Controls

<table>
<thead>
<tr>
<th>APPROACH</th>
<th>DESCRIPTION</th>
<th>KEY CONSIDERATION</th>
<th>BEST PRACTICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parking Charges</td>
<td>As part of an integrated transport policy, local authorities and parking operators increase charges to increase motoring costs and promote modal transfer</td>
<td>Affects all motorists parking based Penalisces those motorists with low incomes most</td>
<td>Many cities worldwide</td>
</tr>
<tr>
<td>Parking Supply Controls</td>
<td>Reduction in the number of spaces or designation of short term and long term parking</td>
<td>Does not affect motorists with designated parking spaces available</td>
<td>Used worldwide</td>
</tr>
<tr>
<td>Development Control</td>
<td>Restrict number of parking spaces provided by new developments</td>
<td>Controls can be defined for different areas Issue of different levels between neighbouring authorities Can be related to accessibility</td>
<td>Used worldwide</td>
</tr>
<tr>
<td>Workplace Parking Levies</td>
<td>Governments seek to increase the annual taxation on vehicles to moderate vehicle ownership</td>
<td>Provide users with access to a vehicle but without the need to purchase</td>
<td>Perth, Melbourne Sydney</td>
</tr>
</tbody>
</table>

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use of public transport (in particular, public transport to and from or within, those districts).” Parking Space Levy rates are indexed annually to movements in the Consumer Price Index (All Group Index) for Sydney. From 1 July 2010 the Parking Space Levy rates are:

- $2,040 per space in Category 1 areas
- $720 per space in Category 2 areas

Some parking spaces are exempt from PSL, for example where a space is set aside exclusively for

- The parking of motor vehicles by persons who hold mobility parking scheme authorities
- The parking of motor vehicles by persons who reside on the premises or on adjoining premises
- The parking of motor vehicles for the purpose of loading/unloading of goods or passengers
- The parking (without charge) of any motor vehicles owned or occupied by a religious body, a public charity or benevolent institution

Examples of projects upon which PSL funds have been spent to date are:

- Interchanges for bus, rail and ferry services
- Commuter car parking facilities
- Improving public transport infrastructure, such as the development of bus rapid transit, bus stations and light rail (tram service), which provide services within or to/from PSL leviable districts
- Improvement of electronic passenger information systems associated with the above-mentioned infrastructure

Similar schemes have been introduced in Melbourne and Perth. In Perth, parking suppliers within the CBD and surrounding area must pay a Parking Licence Fee, which has different rates for short-term and long-term use facilities. Owners only pay for the number of parking spaces that are actually in use, and may shift a space from one category to another (from “in use” to “out of use”). Businesses with five parking spaces or less are exempted from the charge. The levy rises about AU$9 million annually. In Melbourne, a Long Stay Car Park Levy is charged to designated long-stay and permanently leased parking spaces in CBD commercial car parks. The levy is intended to encourage car park owners to convert long-stay spaces into short-stay spaces, creating more parking options for shoppers and visitors. The levy applies to about 52,000 off-street parking spaces. A 2010 review of the program concluded that it has been moderately successful at shifting long-term to short-term parking and reducing traffic congestion (Parking Taxes: Evaluating Options and Impacts- Victoria Transport Policy Institute 2011).

In the United Kingdom, Nottingham plans to implement a Workplace Parking Levy (WPL) on employers’ parking spaces and this scheme is termed a Workplace Parking Levy (WPL). This will apply to employers that provide 11 or more liable parking places starting April 2012. It is a charge on businesses although employers can decide whether or not to pass the charge on to their employees. It is proposed that all WPL revenue will be invested into improving public transport. This is being implemented as an alternative to a road user charge. The WPL is projected to reduce traffic congestion. The pricing itself is expected to have only a small impact, since only a small portion of the fee is expected to be passed onto commuters, but the additional land public transport service funding is predicted to increase City Centre public transport travel by over 20% and reduce area traffic growth from 15% to only 8%, which should provide significant congestion reduction benefits.

A.8
Road User Charging

RUC schemes (also called urban congestion charging or road pricing) involve directly charging drivers for the use of the roads on which they drive. The charges are designed to reduce traffic congestion and its associated problems. Charging systems can reduce traffic levels by typically 15 to 20 per cent. However they can also offer even more substantial reductions in traffic congestion can help improve journey time reliability, lead to reduced vehicle emissions, and reductions in accidents and improvements in the quality of the public realm. They also raise revenue which may or may not be ploughed back into the transport system, enabling improvements to be made to the road network and/or public transport.
The idea behind such schemes is underpinned by neo-classical economic theory. This views traffic congestion as an external cost which drivers impose on other road users (resulting in time delays) and non-road users (such as air pollution) and which they do not take into account in deciding whether or not to drive. Many countries have tried to internalise these congestion costs, through for example high rates of fuel taxation, or imposing regulatory standards on vehicle emissions. Whilst this approach pushes up the general costs of motoring (or improves vehicle emissions), it is relatively ineffective in addressing the costs of traffic congestion. This is because these taxes or measures apply irrespective of the volumes of traffic on the road or where congestion happens to occur.

For almost 50 years, since the publication of the Smeed Report for the UK government, the notion has existed of imposing direct charges on drivers to ensure that they take better account of their congestion costs. In an ‘ideal’ scheme, the charges would vary according to:

- Location (charges would be more expensive in the city centre)
- Distance travelled (those driving more create more congestion)
- Time of day (more expensive at peak times)
- Type of vehicle (more expensive for large and polluting vehicles)

RUC can take the following three basic forms, although for each of them there are a range of variations, from simple to complex:

- Area or zonal schemes - Vehicles using all roads within a designated area pay a licence fee, usually within designated times and sometimes related to vehicle type. The Singapore Area Licensing Scheme was an early example. The congestion charging scheme operating in Central London applies the same principle but does not vary charges by vehicle type
- Cordon pricing (or ‘toll rings’) - Charging points are located at all entries to a given area (often a city centre), usually with higher charges for large or polluting vehicles and at more congested times of day. Charges are incurred when vehicles pass a charging point. Oslo has been operating a toll ring since 1990 and the Stockholm scheme uses cordons
- Corridor or point charges- such as for a crossing location (bridge or tunnel) or toll road corridor
- Continuous charging systems - These charge vehicles for all travel within a defined area (such as a city). The charge can be based on the distance travelled or time spent travelling, or can involve a charging point on every road link. The complexity of these systems means that a fully automatic electronic charging system (‘electronic road pricing’ or ERP) must be used. Singapore is using an ERP system. This is not yet a truly continuous system, but may become one in the future

In recent year’s new advances in technology have enabled the type and complexity of charging systems to be expanded to encompass manual, video-based and fully electronic systems. In addition the technology now exists, in off-the-shelf, non-proprietary forms, to address traditional concerns about data privacy and enforcement issues. In short, technology is no longer a barrier to the implementation of sophisticated road pricing systems.

Despite the clear economic benefits from charging systems, recent advances in technology and clear evidence of their effectiveness as a tool for addressing the growing global phenomenon of traffic congestion, very few urban congestion charging schemes have actually been implemented around the World. The key issue that explains the very slow take-up of charging schemes is public acceptability (or more correctly their unacceptability) to drivers and to others who may be affected by it, such as businesses located within a charging area.

Given all of the above, it is clearly important to understand the primary objectives that underlie the introduction of any particular road pricing scheme and to ensure that the finally implemented scheme is of a form such that it clearly meets the stated objectives. Through instilling such clarity into the process public understanding and acceptance can be greatly improved.

In essence, the objectives that might underlie the introduction of any particular road pricing scheme can be sub-divided into a desire to achieve one or more of four outcomes. These being the attainment of:
• Economic efficiency - encouraging all motorists to make equitable travel decisions based on the social marginal cost of their travel
• A pre-determined minimum level of service, in terms of travel speeds, prevailing environmental conditions, etc. - encouraging some motorists to change their travel behaviour for the benefit of those who continue to drive or those who live within a particular location
• Financial cost recovery - simply imposing a charge on all motorists to recover the financial cost of providing roads (under this objective there is no specific need to reduce traffic levels, the only objective being one of cost recovery within a specified time period)
• Revenue maximization - under this objective, no specific targets are set in respect of efficiency, level of service or cost recovery, maximising revenue is the only consideration

The following tables compare the performance of the most significant Road User Charging Schemes in the world.

In summary the key factors than should not be ignored:
• Scheme must be ‘sold’ to motorists
• Policy objectives (e.g. reduce congestion, make a financial return, environmental benefits, etc.) have large impacts on actual scheme shape and function
• Charging & enforcing can introduce legal complexities
• Economic responses: driving less, changing routes, switching to exempt vehicles, moving house
• Politics trumps technical/ economic efficiency

### Table A.7: Road User Charging Methods

<table>
<thead>
<tr>
<th>APPROACH</th>
<th>DESCRIPTION</th>
<th>KEY CONSIDERATION</th>
<th>BEST PRACTICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cordon ring(s)</td>
<td>vehicles pay fee each time they cross into a bounded area</td>
<td>Radio transceiver Number plate recognition Toll plazas</td>
<td>Bergen, Durham, Florence, Oslo, Rome, Singapore, Stavanger, Stockholm, Trondheim</td>
</tr>
<tr>
<td>Corridor</td>
<td>vehicles pay charges for specific road, bridge, tunnel, etc. which feeds into congested area</td>
<td>Radio transceiver Plate recognition Toll plazas</td>
<td>Czech Republic, England, France, Greece, Italy, Portugal, Spain + others</td>
</tr>
<tr>
<td>Network</td>
<td>vehicles pay distanced based fee for km travelled</td>
<td>GPS based</td>
<td>Austria, Germany (trucks), Switzerland (trucks), Netherlands</td>
</tr>
<tr>
<td>Area license</td>
<td>vehicles pay fee per period (i.e. day) to access a given area</td>
<td>Number plate recognition</td>
<td>London, Milan</td>
</tr>
</tbody>
</table>
### Table A.8: Comparison of Urban Congestion Charging Schemes

<table>
<thead>
<tr>
<th>Scheme</th>
<th>Charging Approach</th>
<th>Justification For Charging</th>
<th>How it works</th>
<th>Enforcement</th>
<th>Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>London (2003-Present)</td>
<td>Area license</td>
<td>• Reduce congestion</td>
<td>• Automatic number plate recognition</td>
<td>• Violations treated as civil NOT criminal offense</td>
<td>• 2007 vs 2002 ↓16% in # of all vehicles entering zone</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Generate revenues</td>
<td>• Drivers pay charges via: direct debit (CC Auto Pay 2011), call center, post,</td>
<td></td>
<td>• 2007 vs 2002 ↓15% in # of non-chargeable vehicles - esp. alt. fuel</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Discourage private cars</td>
<td>• Email, shop</td>
<td></td>
<td>vehicle</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Hours: 07h00-18h00 (work days)</td>
<td></td>
<td>• No discernable impacts on business</td>
</tr>
<tr>
<td>Singapore (ERP 1998-Present)</td>
<td>Multiple cordon</td>
<td>• Manage traffic speed</td>
<td>• Charge for granty crossing via in-vehicle units tied to vehicle registration</td>
<td>• Photo enforcement w/fines</td>
<td>• Original scheme from 1975: ↓44% in central area traffic; Bus riders inc. from 33% to 46%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Top-up based cash card usable with different in-vehicle units</td>
<td>• Violators charged flat day rate - no longer treated as court summons</td>
<td>• Post ERP: # vehicles entering ↓15%. reason for post ERP = reduced multiple crossings</td>
</tr>
<tr>
<td>Stockholm (2006 trial) (2007-Present)</td>
<td>Cordon</td>
<td>• Reduce # vehicles entering city</td>
<td>• Automatic license plate recognition w/optional transceiver redundancy</td>
<td>• Peak hour congestion reduced 25%</td>
<td>• Initial traffic reductions =3 -5%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Improve road access</td>
<td>• Free payable for cross cordon (entry/exit)</td>
<td>• Public transport use +8%</td>
<td>• PT patronage increase =6 -9%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Reduce emissions</td>
<td>• Payment via direct debit, store, online account</td>
<td>• Retail sales +10%</td>
<td>• Large impact on revenues</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Improve street level quality of life</td>
<td>• Hours:08h00 - 16h30 (work days)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oslo (1990-Present)</td>
<td>Cordon</td>
<td>• Raise revenues to enable greater infra, investment</td>
<td>• Pay when crossing toll boundaries along 4 corridors leading to city</td>
<td>• Video enforcement with ex-post fines</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Payment options: transponders (AutoPass) and manual (diminishing)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• 24/7 all days</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Milan (2008-Present)</td>
<td>Cordon</td>
<td>• Improve air quality in city center</td>
<td>• Automatic number-plate recognition cameras</td>
<td>• First 9 months traffic ↓3.9%, Subway use ↑9.2%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Exemption for hybrids/ scooters/smog filters</td>
<td>• Particulates ↓19%, NOx ↓14%, CO2 ↓15%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Hours:07h30-19h30 (work days)</td>
<td>• Switching to exempted veh. congestion near original levels</td>
<td></td>
</tr>
</tbody>
</table>
**Table A.9: Comparison of Urban Congestion Charging Schemes (cont.)**

<table>
<thead>
<tr>
<th>Scheme</th>
<th>Implementing Institution</th>
<th>Political Considerations</th>
<th>Partially Attributable Political Outcomes</th>
</tr>
</thead>
</table>
| London (2003-Present) | • TfL under the Greater London Authority’s authorisation         | • Congestion = Livingston election in 1999 when running as independent  
• Johnson support = outer London districts (i.e. charge payers). 2008 election pledge to consider removing Western half of charging zone                                                                                                                                                                                                 | • Livingston elected in 2000, re-elected in 2004  
• Johnson ousts Livingston in 2008. Following win, commissions study into Western zone’s future. removes charging in Western Zone in 2011  
• 2008 survey on Western Zone: 19% said keep, 69% said remove, 12% said tweak                                                                                                                                                                                                 |
| Singapore (ERP 1998-Present) | • Land Transport Authority                                           | • Strong central state run by highly capable technocrats  
• Government’s legitimacy founded in economic growth & improved living conditions                                                                                                                                                                                                 | • Residents trade stakeholder input & influence for comfort and economic progress  
• ERP part of fully integrated approach to planning virtually everything                                                                                                                                                                                                                                 |
| Stockholm (2006 trial) (2007-Present) | • National Road Administration (federal gov.)                     | • Scheme = Green’s condition for supporting Social Democrats to form government in 2002  
• Same coalition held majority at national and local level  
• Initial trial had to fit within 4 year election cycle                                                                                                                                                                                                 | • Referendum following initial trial: city residents vote = ‘continue’, surrounding areas vote = ‘discontinue’  
• 2007 survey of city residents - 67% favour charges, 28% oppose                                                                                                                                                                                                                                     |
| Oslo (1990-Present) | • Fjellinjen - not for profit co-owner by Oslo City and Akerhus Country | • Traffic alignment from 1620’s failing under modern car use--> driving economic decay in central area and incentivising action  
• Strong rural / regional influence in politics--> less support for urban infra  
• Local conservative/liberal parties agreed on need for additional financing                                                                                                                                                                                                                                                                   | • Geographical interests appeased - revenues earmarked for expenditure in specific areas (40% Akerhus, 60% Oslo)  
• Public owned co.(Fjellinjen) establish to manage toll collection                                                                                                                                                                                                                                               |
| Milan (2008-Present) | • Commune di Milano (city)                                         | • 2006/2007 record years for particle emissions in Lombardy region  
• EU air quality directive under development since 2005, signed 2008---> compliance  
• Letizia Moratti, commits to congestion charging in 2006 election campaign to address air quality                                                                                                                                                                                                 | • Moratti elected  
• Same party mayors from cities outside Milan oppose--->conflicts from within Moratti’s party  
• Original scheme area = 65km² scaled to 8.2km² after political opposition from within Moratti’s party  
• Scale / impact of scheme greatly reduced due to political changes                                                                                                                                                                                                                                      |
### Table A.10: Comparison of Urban Congestion Charging Schemes (cont.)

<table>
<thead>
<tr>
<th>Scheme</th>
<th>Charges</th>
<th>Scale &amp; Revenues</th>
<th>Use of Revenues</th>
<th>Lessons Learnt</th>
</tr>
</thead>
</table>
| **London (2003-Present)** | • GBP 9-12 depending on time of payment  
• Charges on traffic entirely within area via camera recognition | • 22km² (original) plus 17 km² for Weser zone (removed Feb. 2011)  
• ~321k vehicles/day (western zone)  
• ~209/10: rev =GBP 312.6m | • Constrained by law to plans approved by Greater London Authority  
• Revenue uses (2007/08): bus network impr. (82%), roads / bridge (9%) | • Congestion charging can create political opportunities both for incumbents and for opponents |
| **Singapore (ERP 1998-Present)** | • SGD .25 - 8.00 per gantry depending on vehicle type and time of crossing | • 7km² Central Business District cordon plus outer expressway gantries  
• 66 gantries define independent CBD cordons plus outer expressway cordon  
• ~206k transactions/day in 2006 | • Income returned to general consolidated fund of the government | • Relatively low-tech solutions can actually work well  
• Flexible charging affords significant control over traffic patterns |
| **Stockholm (2006 trial) (2007-Present)** | • SEK 10-20 depending on time of crossing  
• No charges apply within cordon | • 30 km² cordoned area  
• ~350k vehicles per day charged  
• 2008 revenues SEK 850m | • Reinvested in regional roads infrastructure | • Legal considerations & approach to enforcement can significantly affect cost, & technical specification |
| **Oslo (1990-Present)** | • NOK 26-78 per day depending on gross vehicle weight  
• No time dimension to charges | • ~75km² (very rough estimate)  
• 242,663 crossing per day in 2009  
• 50% of population work inside toll ring  
• 2010 rev: NOK 2.2b/year | • Money earmarked for financing parliamentary approved capex in Oslo area  
• Newest allocation towards PT operations in Oslo area | • Charging income can be substantial if cordon is optimised for revenue generation  
• Conspicuous benefits can reverse negative public perceptions |
| **Milan (2008-Present)** | • EUR 2-10/day depending on emission class  
• No time dimension to charges | • 8.2km² chargeable area  
• ~20k vehicles per day charged  
• Revenues = EUR 29-42 million/year | • Not disclosed | • Political affiliations of adjacent areas is highly relevant to scheme design esp. same party affiliations |
INTERCHANGE & INTEGRATION PLAN
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1 BACKGROUND
Chapter 6: Interchange & Integration Plan

1 BACKGROUND

1.1 Introduction

The IIP is to set the basis for the development of interchange and integration, which can function as ‘glue’ to join all the land public transport modes together to enable easier, quicker and more convenient transfers between land public transport services. This will result in wider ranging and more frequent travel opportunities for land public transport users in Greater Kuala Lumpur/Klang Valley.

The purpose of the IIP is to review the current status of interchange and integration as well as developing guidelines for design, planning and operation of interchange. The IIP also identifies the strategy intended to enhance the integration and accessibility of land public transport. The IIP focuses on multimodal interchange between one mode of public transport and another, but where appropriate also considers interchange between land public transport and feeder modes such as walking, cycling and motor vehicles.

At the time of writing this document where the detailed alignment and station locations are not fully known, it is considered premature for the Greater Kuala Lumpur/Klang Valley Master Plan to set comprehensive and detailed hierarchy together with accessibility provision for all stations. These elements will be developed further in the Master Plan Execution Phase where examination of the technical and financial feasibility (post September 2011) will be undertaken by SPAD and or relevant delivering partners.

1.2 Structure of the Interchange and Integration Plan

This chapter provides a summary of the IIP for the Greater Kuala Lumpur/Klang Valley region. The next chapter reviews the existing status of integration in the region, particular with respect to interchange and integration. Chapter 3 presents guidance containing design principles, guidance and evaluation framework for design, planning and operations of interchange and integration. Chapter 4 identifies the ‘broad’ accessibility strategy to enhance station integration while Chapter 5 addresses the issue of ticketing integration. Chapter 6 provides an overall summary of the IIP.
Key Conclusions

SPAD had developed the National Land Public Transport Master Plan to set out the vision and guiding principles for public transport in Malaysia.

The objective of the National Land Public Transport Master Plan is to drive the development of the Master Plan, which comprises of Regional Master Plan and Sector Plans.

The National Land Public Transport Master Plan provides Planning Guidelines to guide the development of Regional Master Plans.

The first Regional Master Plan developed by SPAD is for the Greater Kuala Lumpur/Klang Valley Region, the Greater Kuala Lumpur/Klang Valley Master Plan.

The IIP is one of six subsidiary plans of the Greater Kuala Lumpur/Klang Valley Master Plan.

To avoid ambiguity the word ‘interchange’ refers to a gateway to get to the public transport network. It also represents the interface between land public transport services and the surrounding area, which includes connections to other feeder modes of access, such as walking, cycling, taxi or motor vehicles.
2 ASSESSMENT OF CURRENT CONDITIONS
Chapter 6: Interchange & Integration Plan

2 ASSESSMENT OF CURRENT CONDITIONS

2.1 Introduction

Chapter 2 reviews the existing conditions of the interchange and integration of land public transport services in the Greater Kuala Lumpur/Klang Valley. Based on the stakeholder engagement feedback and data collation from relevant authorities and operators, the review considers:

- Interchange between land public transport modes
- Integration with feeder modes including walking, cycling and private vehicles (park and ride and pick up/drop off facilities)
- Fares and ticketing integration

This chapter also provides updates of current progress of the on-going NKRA initiatives on transport terminal infrastructure, station and ticketing integration. Last but not least, it identifies the possible key challenges ahead for the successful implementation of the Interchange and Integration Plan.

2.2 Interchange Between Land Public Transport Modes

2.2.1 Rail to Rail Interchange

There are currently 9 interchange stations on the existing urban rail network (see Table 2.1). The current provision of interchange between land public transport modes is inadequate due to physical and ticketing constraints. While KL Sentral offers the best convenience in terms of interchanging between KTM trains and LRT, it is not well integrated with the KL Monorail service. Similar situations exist in other interchanges such as Dang Wangi/Bukit Nanas station, Bank Negara/Bandaraya station and Kuala Lumpur/Pasar Seni station where users have long been frustrated with

Table 2.1 Existing Rail to Rail Interchange

<table>
<thead>
<tr>
<th>Stations</th>
<th>KTM (Sentul, Klj)</th>
<th>LRT (Damansara, Serdang)</th>
<th>Monorail</th>
<th>LRT Klia Express</th>
<th>KTM Jalan 2</th>
<th>KL Extension</th>
<th>Ampang Expansion</th>
</tr>
</thead>
<tbody>
<tr>
<td>KL Sentral</td>
<td></td>
<td></td>
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<td></td>
<td>✔</td>
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<td></td>
</tr>
<tr>
<td>Bandar Tasik Selatan</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>KL/Pasar Seni</td>
<td></td>
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<td></td>
<td></td>
<td>✔</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dang Wangi/Bukit Nanas</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Bank Negara/Bandaraya</td>
<td></td>
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<td>✔</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Masjid Jamek</td>
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<td></td>
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<td></td>
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</tr>
<tr>
<td>Titiwangsa</td>
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<td></td>
<td>✔</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hang Tuah</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✔</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Putra</td>
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<td>✔</td>
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</tr>
</tbody>
</table>

Keys:
- ✔ Interchange
- ✔ Interchange within walking distance
the poor pedestrian connectivity despite the station locations being closed to each other.

Sentr is the primary interchange point between rail lines. But KL Sentral will suffer bottlenecks to satisfy increasing demand for land public transport following the expansion of rail network (i.e. MRT Line 2 and 3) as part of the Greater Kuala Lumpur/Klang Valley Master Plan initiatives. Whilst improvement work has begun to improve integration at Masjid Jamek, Titiwangsa and Hang Tuah, there is certainly need to provide additional high quality interchanges to distribute demand more evenly across the network and expand passenger choices to access to a greater selection of areas. Figure 2.1 provides a schematic map of the existing rail to rail interchange network.

2.2.2 Rail and Bus Interchange

Due to lack of coordinated planning and differing priorities of land public transport operators, integration between rail and bus services are not desirable, particular those associated with KTM stations. Over 48 rail stations within the Greater Kuala Lumpur/Klang Valley remain poorly served by feeder bus services.

Currently there are 64 rail stations with bus services connections, either in the form of feeder bus or other bus services. Feeder bus services are focused at LRT stations along Kelana Jaya Line, Ampang LRT Line and KTM Komuter. However, there are some Ampang LRT and KTM Komuter stations with little or no feeder bus services. Figure 2.2 provides a schematic map of the existing rail and bus interchange network:

Figure 2.1: Schematic Map of Existing Rail Network
Chapter 6: Interchange & Integration Plan

2.2.3 Committed Land Public Transport Development

Urban Public Transport is one of the six objectives of NKRA under the on-going GTP aimed at improving and enhancing the public transport service delivery and infrastructure. There are a number of initiatives aimed at improving the integration of land public transport system.

To date, Integrated Transport Terminal (ITT) in Bandar Tasik Selatan designed to cater for south-bound road-based public transport of the peninsular of Malaysia, was completed and opened in early 2011. ITT Gombak, which aims to disperse 780 north-bound and east-bound buses that are stationed in the city centre and ease traffic congestion, is expected to be ready later next year. ITT Sungai Buloh is expected to be ready by 2016 after the completion of MRT 1 Line.

NKRA initiative will also introduce more feeder services to the 23 congested bus routes and also providing 53 new feeder bus routes to the poorly served rail stations.
Following committed developments on the rail network, such as LRT line extension for Ampang Line and Kelana Jaya Line by 2014 and the new MRT Line 1 Sungai Buloh - Kajang by 2016, the number of interchanges on the Greater Kuala Lumpur/Klang Valley urban rail network will increase from existing 9 to 15. These are summarised in Table 2.2.

Figure 2.3: Provides a schematic map of the committed rail to rail interchange network.
2.3 Interchange with Feeder Modes

An interchange is the gate for intermodal with feeder modes. At present there is a lack of high quality interchange that enables seamless transfer between land public transport and the feeder modes used to get to and from the interchange, for example walking, cycling and private vehicles.

2.3.1 Pedestrian

The pedestrian facilities is important to ensure that pedestrian have proper access to the public transport. Various efforts have already been taken to improve the existing interchanges especially in terms of removing barriers for pedestrian to access the public transport. Under NKRA initiatives the focus is to improve pedestrian links at key land public transport interchanges including Masjid Jamek, KL Sentral, Hang Tuah, Titiwangsa (see Table 2.3).

There is also major upgrading along all 24 Ampang Line LRT stations. The upgrading works including the refurbishment of public facilities (e.g. toilet, surau, etc), platform widening and universal facilities for disabled needs (e.g. ramp, lift, etc).

<table>
<thead>
<tr>
<th>Pedestrian Facilities</th>
<th>Existing Pedestrian Facilities</th>
<th>Committed (NKRA) Initiatives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dang Wangi/ Bkt Nanas</td>
<td>At Grade Crossing</td>
<td>Stations integrations includes covered walkways at Hang Tuah Stations (Q2011)</td>
</tr>
<tr>
<td>Masjid Jamek</td>
<td>At Grade Crossing</td>
<td>Stations integrations for Masjid Jamek stations, includes common concourse for LRT Ampang &amp; Kelana Jaya Line (Q2011)</td>
</tr>
<tr>
<td>KL Sentral</td>
<td>At Grade Crossing</td>
<td>Stations integration at KL Sentral (monorail) temporary walkway (completed), Pedestrian Bridge (Q2012)</td>
</tr>
<tr>
<td>Titiwangsa</td>
<td>Pedestrian Bridge</td>
<td>Stations integration at Titiwangsa stations includes Elevated Double Decker Walkway (Q2011)</td>
</tr>
<tr>
<td>Bank Negara</td>
<td>Pedestrian Bridge</td>
<td>Stations integrations at Hang Tuah stations includes covered walkways (Q2011)</td>
</tr>
<tr>
<td>Hang Tuah</td>
<td>At Grade Crossing</td>
<td>Stations integrations at Hang Tuah stations includes covered walkways (Q2011)</td>
</tr>
<tr>
<td>Bandar Tasik Selatan</td>
<td>Pedestrian Bridge</td>
<td>Stations Upgrades - Chan Sow Lin, Pudu, Cheras, Sentul, Sentul Timur, Cahaya, Cempaka</td>
</tr>
<tr>
<td>KL/Pasar Seni</td>
<td>At Grade Crossing</td>
<td>Pandan Jaya, Pandan Indah, Plaza Rakyat, Maluri, Miharja, Bandaraya, Sultan Ismail</td>
</tr>
<tr>
<td>Putra</td>
<td>At Grade Crossing</td>
<td>PWTC, Ampang, BTS, BTR, SG Besi, Bkt Jalil, Sri Petaling (Q2011)</td>
</tr>
</tbody>
</table>
2.3.2 Park and Ride

The Park and Ride (P&R) is considered a viable alternative for private vehicle users to mode shift to public transport. Current park and ride provision is as indicated in Figure 2.4. The efforts will be enhanced with additional 6800 parking bays for P&R under NKRA initiatives. New P&R facilities will be made available at Sg Besi, Bandar Tun Razak and Bandar Tasik Selatan (see Figure 2.5) to address the need for more P&R facilities.

**Figure 2.4: Current Park and Ride Provision**
2.3.3 Other Feeder Modes - Taxi, Motorcycle and Bicycle

Taxi facilities provision at interchange is inconsistent across Greater Kuala Lumpur/Klang Valley though taxi stands are normally provided in key interchanges and major developments. Improvement for access to bicycle and motorcycle is not explicitly set out in NKRA and often not integrated with the overall station improvement. For example, parking facilities for bicycle are often not provided at the moment.

2.4 Fares and Ticketing Integration

Currently, it is not possible to interchange between rail networks in the Klang Valley without having to first leave the ticket barriers of each individual station due to lack of an integrated ticketing system across land public transport modes (i.e. between rail and bus).

However, NKRA has identified integrated smart ticketing system as one of the key measures to improve integration and to reduce journey times.
Implementation of cashless ticketing based on the Touch-n-Go card is introduced across all land public transport operators within the Greater Kuala Lumpur/Klang Valley with the aim to provide a seamless land public transport journey experience to commuters.

Current status, Touch n Go card is now accepted by all rail operators except Express Rail Link (ERL). For buses it is only accepted for use in Rapid KL buses. Due to the incomplete coverage across all land public transport modes and lack of discount for the cashless system, the penetration of Touch-n-Go system is still considered low compared to similar systems in Hong Kong and Singapore.

Following the introduction of a new Automatic Fare Collection (AFC) system, by end 2011 commuters only need to buy a single ticket for all three rail services, namely LRT Kelana Jaya, LRT Ampang and KL Monorail lines. By 2013 the AFC system would incorporate RapidKL buses and KTM Komuter.

The new AFC system will allow customers to buy and reload tickets online, eliminating queuing at ticket vending machines and ticket counters. Loyalty points will also be introduced to reward frequent users to encourage take up rate.

2.5 Key Challenges

The planning of interchange is imperative to ensure the success of the Greater Kuala Lumpur/Klang Valley Master Plan. The capacity and quality of existing interchanges will no longer be able to cater for the significant increase of demand in the future following the expansion of land public transport network as part of the Greater Kuala Lumpur/Klang Valley Master Plan.

The following are key challenges in improving interchanges:

- There is a need to provide a clear hierarchy to define role and functionality of interchange i.e. feeder bus services
- There is a need to improve the quality of interchange including layout and facilities
- There is a need to establish strategy to ensure adequate interchange facilities including pedestrian and park and ride facilities
- There is a need for integrated fare and ticketing

Key Conclusions

At present the interchange between land public transport modes and integration with feeder modes are considered not satisfactory.

There are a number of on-going initiatives under NKRA Urban Public Transport to improve the interchange and integration of land public transport system.

Committed land public transport developments will introduce additional interchanges and associated facilities to enhance the interchange provision.

There are however a number of challenges facing those wanting to improve interchange and integration of land public transport system.
3 INTERCHANGE GUIDELINES
3 INTERCHANGE GUIDELINES

3.1 Introduction

An interchange is a gateway to get to the public transport network, where interchange between land public transport modes and connections to other feeder modes of access, such as walking, cycling, taxi or motor vehicles take place. A high quality public transport system, incorporating best practice interchanges, shall aim to achieve a ‘seamless’ journey that is as close to ‘door to door’ travel as possible.

This chapter provides an overview of planning, implementing and operation of interchanges to measure the performance of existing and future interchanges and to encourage cooperation and organization between delivering partners with the aim of providing improved level of service for passengers.

The following guidance has been developed as part of the Interchange and Integration Plan:

- To raise awareness of interchange best practice and encourages its promotion and adoption
- To promote planning and design which considers balanced interests of all parties involved
- Where appropriate, to assist local authorities in the preparation of broader planning policies (such as Local Plans) and the planning/design of future interchanges
- To improve the overall quality and efficiency of land public transport interchanges in the Greater Kuala Lumpur/Klang Valley

The focus of the guidance is on multi-modal interchange between one mode of land public transport and another land public transport mode. It also considers the interchange between public transport and its ‘feeder’ modes for example walking, motorcycle and private car vehicles. The guidance is intended to supplement, rather than replaces, current standards and other legal and discretionary requirements that apply to planning, design and operation of public transport interchanges and should be interpreted in the context of these standards.

3.2 Design Principles

When designing or improving the quality of an interchange, the following design principles shall be applied at the interchange planning and design development stage and carry on to the interchange facility management agreement to ensure the optimal design is retained post implementation:

- Consider the interchange from the perspective of those with an interest in it, such as passengers, local residents, transport operators, regulatory authorities, providers or developers of facilities and services at interchange. This can help to balance the differing needs of users and the differing objectives, priorities and processes of delivering partners (see Table 3.1)
- Identify the flows and movements of people and services within the interchange and between the interchange and the surrounding area. Consideration should be given to
- Identify the functions of various spaces within and surrounding an interchange and the activities going on there. The attributes of these spaces are defined in Table 3.2.

**Table 3.1: Differing Needs and Objectives of Stakeholders in Interchange**

<table>
<thead>
<tr>
<th>Commuters</th>
<th>Other passengers i.e. tourists, leisure</th>
<th>Disabled and reduced mobility</th>
<th>Commercial/ Retail Operators/ Developers</th>
<th>Local Authority</th>
<th>Operators</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Maximum convenience</td>
<td>• Staff presence</td>
<td>• Minimum grade changes</td>
<td>• Maximum interior floor space/ frontage for retail or other commercial activities</td>
<td>• Space &amp; time efficient transport interchange</td>
<td>• Fast, simple, &amp; convenient point between services</td>
</tr>
<tr>
<td>• Minimal journey times and distances</td>
<td>• Simple and intuitive way finding</td>
<td>• Disabled facilities (i.e. ramp, lifts)</td>
<td>• Economic growth and regeneration (both socio economic and physical)</td>
<td>• Efficient movement of passengers, minimal obstruction</td>
<td></td>
</tr>
<tr>
<td>• Reliability</td>
<td>• Service and local information</td>
<td>• Remove barriers that prevent travelling freely</td>
<td>• Access to jobs and services</td>
<td>• Revenue generation</td>
<td></td>
</tr>
<tr>
<td>• Real time information</td>
<td>• Pleasant ambience and waiting areas</td>
<td>• External space for commercial, residential or cultural/leisure development</td>
<td>• Greater modal choice</td>
<td>• Efficient movement of public transport vehicle</td>
<td></td>
</tr>
<tr>
<td>• Safety</td>
<td>• Cleanliness</td>
<td>• High passenger/visitor numbers</td>
<td>• Protection an enhancement of the built and natural environment</td>
<td>• Safety</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Ticket sales and information</td>
<td>• Commercial/financial viability</td>
<td>• Improved safety and security</td>
<td>• Built in recovery time &amp; resilience to service disruption</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• High quality mixed used space</td>
<td>• Improved local image and character</td>
<td>• Passenger and vehicle safety and security</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Servicing arrangements</td>
<td></td>
<td>• Tickets sales</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• A recognisable location</td>
<td></td>
<td>• Minimising operating costs</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Transport operator facilities and equipment</td>
<td></td>
</tr>
</tbody>
</table>
### Table 3.2: Attributes of Interchange Spaces

<table>
<thead>
<tr>
<th>Type of space</th>
<th>Key Activities</th>
<th>Examples</th>
<th>Design Principles</th>
</tr>
</thead>
</table>
| Decision Spaces    | Areas where passengers decisions take priority.                                 | Entrances, ticket offices, corridor junctions                            | Good sight lines and clear signing of transport information  
No non-essential infrastructure or visual distractions such as advertising/retail or other land uses that would distract or confuse passengers |
| Movement Spaces    | Areas where people move between land public transport modes or the surrounding area, connecting to Decision Spaces | Corridors and paths reserved for passenger movement                     | Clear, unobstructed routes matching desire lines  
Street furniture, advertising, information displays or any other fixed items should not protrude into these spaces but may be located adjacent to them. |
| Opportunity Spaces | Areas of the interchange that are outside the core areas of decisions or movement | Can accommodate cafes, retail entrances, retail display, seating or landscaping | Street furniture, advertising or any other fixed or temporary infrastructure located in these spaces must be managed so as not to protrude into decision or movement spaces. |
The relative importance of each principle will vary depending on local objectives and strategic priorities; and these should be agreed jointly with stakeholders prior to commencement of evaluation.

The evaluation framework is not intended to limit flexibility and as such, no weightings are applied. Nevertheless decisions about transport functionality of an interchange would always be expected to take precedence over matters of aesthetics.

3.3 Evaluation Framework

The evaluation framework sets out the key principles that must be considered and addressed during the planning, design stage of an interchange. These are categorized under 4 main themes:

- Efficiency
- Usability
- Understanding
- Quality

These together with their detailed considerations are summarised in Table 3.3.

The framework can be used to evaluate the quality or design of a new interchange or improvement scheme at various stages:

- At the start of a scheme - to inform design decisions
- During scheme development - to ensure problem areas are appropriately addressed
- At the end of a scheme - to review outcomes and highlight lessons learned for future interchange schemes.

The framework can also be used as an audit tool to appraise existing interchange and determine if improvement work is required. A simple approach to evaluation is to use a ‘traffic light’ method that each principle will be assessed and scored as ‘red’, ‘amber’ or ‘green’, where:

- A ‘green’ signifies all criteria under the principle has been considered and properly addressed.
- An ‘amber’ indicates that some criteria have been considered and addressed.
- A ‘red’ shows that few if any of the criteria have been considered and addressed.

‘Red’ and ‘amber’ scoring indicate that further considerations would be required if the interchange is to be considered best practice while ‘green’ reflects principles that meet the best practice standards.
### Table 3.3: Evaluation framework criteria

<table>
<thead>
<tr>
<th>Theme</th>
<th>Key Principles</th>
<th>Keys to consider</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Efficiency</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operations</td>
<td>Interchange functions balanced &amp; integrated</td>
<td>Design capacity meet the demand</td>
</tr>
<tr>
<td></td>
<td>Coordinated public transport services coordinated</td>
<td>Coordinated ticketing arrangements</td>
</tr>
<tr>
<td></td>
<td>Clarity defined paid area and passengers movements</td>
<td>Interchange safety</td>
</tr>
<tr>
<td></td>
<td>Effective maintenance</td>
<td>Display place for temporary information</td>
</tr>
<tr>
<td></td>
<td>Efficient arrangement of access</td>
<td></td>
</tr>
<tr>
<td>Movements within interchange</td>
<td>Easy and accessible movement within and outside interchange</td>
<td>Prioritized the feeder modes</td>
</tr>
<tr>
<td></td>
<td>Minimized the passengers flows conflicts</td>
<td>Unobstructed pedestrian routes</td>
</tr>
<tr>
<td>Movements through interchange zones</td>
<td>Understandable patterns of movements</td>
<td>Optimised the service routes</td>
</tr>
<tr>
<td></td>
<td>Optimised design of lift and escalator locations</td>
<td>Connection of interchange zone with external facilities</td>
</tr>
<tr>
<td><strong>Sustainability</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Source of build material is high quality, durable, and sustainably</td>
<td>Design and management sensitive to the environment and energy efficient</td>
</tr>
<tr>
<td><strong>Accessibility</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>All area are reachable</td>
<td></td>
</tr>
<tr>
<td></td>
<td>All services offered level boarding</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Clearly designed step and obstacle free routes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Optimised design of lift and escalator locations</td>
<td>Members of staff visible</td>
</tr>
<tr>
<td><strong>Safety and Accident Prevention</strong></td>
<td>Meet all the emergency and security requirements</td>
<td>Safety of locations where passengers and vehicles meet</td>
</tr>
<tr>
<td></td>
<td>Minimised the potential hazards</td>
<td></td>
</tr>
<tr>
<td><strong>Personal Security</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Specialised Crime Preventions Through Environmental Design</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Designed out the isolated locations</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Has effective use been made of CCTV used effectively</td>
<td></td>
</tr>
<tr>
<td><strong>Protected Environment</strong></td>
<td>Used vandal-proof fixtures and fittings</td>
<td></td>
</tr>
<tr>
<td><strong>Understanding</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Legibility</td>
<td>Easy layout.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lighting used efficiently</td>
<td></td>
</tr>
<tr>
<td>Permeability</td>
<td>Rationised infrastructures and street furniture</td>
<td></td>
</tr>
<tr>
<td>Wayfinding</td>
<td>Internal and external destinations connection</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Facilitate movement through paid/controlled areas</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Easy movement to and from surrounding area</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Wayfinding design and signing facilitate intuitive movements</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Support movements &amp; minimised obstructions by lighting</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Technology being used to support way finding</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Clearly designed step and obstacle free routes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Interchange spaces retain their modal identity</td>
<td></td>
</tr>
<tr>
<td>Service Information</td>
<td>Information meet with the needs of all passengers</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pre - journey information located and available</td>
<td></td>
</tr>
<tr>
<td>Perception</td>
<td>Facilities meet the needs of users, operators, and owner</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Facilities add value to the user experience</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Interchange connections maximise convenience and ease of use</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Demonstration high standards of cleanliness, comfort, and safety</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Interchange zone exceed minimum expectations for quality of materials and finishes</td>
<td></td>
</tr>
<tr>
<td><strong>Quality</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quality of Design Built</td>
<td>Easy layout of the interchange</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Added value of materials and finishes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Products and furniture used consistent with standards</td>
<td></td>
</tr>
<tr>
<td>Urban Realm</td>
<td>Appropriate size of spaces for predicted current and future uses</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Added value and convenience of activities within interchange</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Integrate design with urban context</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Well open, connected and safe spatial design</td>
<td></td>
</tr>
<tr>
<td>Sense of Place</td>
<td>Connection of interchange zone with external facilities</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Quality of design create tangible added value to the local area</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Commercial facilities offer appropriate to the interchange zone</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Landmark buildings or features add to the sense of place</td>
<td></td>
</tr>
</tbody>
</table>
4 INTEGRATION STRATEGY
Chapter 6: Interchange & Integration Plan

4 INTEGRATION STRATEGY

4.1 Introduction

This chapter details the strategy to improve the integration of land public transport and to enhance the accessibility to stations. The focus is to enable people to travel within multi-modal public transport network and carry out their first and last mile seamlessly.

To achieve targeted mode shift aspired by the Master Plan the land public transport system in Greater Kuala Lumpur/Klang Valley must be well planned and highly integrated. An Integration and Accessibility Strategy has been developed to assist in delivering this objective.

The Integration Strategy mainly involves the followings:
- Interchange between land public transport mode
- Fare and ticketing integration
- Integration with feeder modes

4.2 Integration between Land Public Transport Modes

A key component of developing an integration strategy in Greater Kuala Lumpur/Klang Valley is the effective integration of the land public transport modes, in order to join the land public transport modes together. Seamless transfers and convenient journey experience are crucial if a more comprehensive range of destinations is to be served.

In developing the integration strategy the approach is to:
- A significant increase in the number of interchanges on the urban rail network
- Establish a hierarchy of interchange to integrate urban rail and bus services
- Interchange with the national transport network

4.2.1 Increase in the Number of Interchanges on the Urban Rail Network

In line with the Greater Kuala Lumpur/Klang Valley Master Plan, it is anticipated that there will be additional interchange stations on urban rail network, both between the new lines and between the new lines and the existing lines. In particular, the provision of the interchange stations along MRT Circle Line and suburban areas will result in more effective dispersal of trips across the whole network and avoid unnecessary convergence of trips to city centre.

Together with the development of new urban rail lines the number of interchange will increase from current 9 to 23. Table 4.1 summarises possible rail to rail interchange in future:
Table 4.1: Future Rail To Rail Interchange

<table>
<thead>
<tr>
<th>Stations</th>
<th>KTM (Sentul - P. Klang)</th>
<th>KTM (Rawang - Seremban)</th>
<th>Kelana Jaya</th>
<th>Ampang</th>
<th>Monorail</th>
<th>ERL/KLIA Express</th>
<th>MRT 1</th>
<th>KJ Extension</th>
<th>Ampang Extension</th>
<th>Putrajaya Monorail</th>
<th>Monorail extension</th>
<th>MRT 2 ph 1</th>
<th>MRT 3 ph 1</th>
<th>MRT 2 ph 2</th>
<th>MRT 3 ph 2</th>
<th>LRT PJ-Klang</th>
</tr>
</thead>
<tbody>
<tr>
<td>KL Sentral</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
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<td>✓</td>
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<tr>
<td>Bandar Tasik Selatan</td>
<td>✓</td>
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<tr>
<td>Sg Buloh</td>
<td>✓</td>
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<tr>
<td>KL/Pasar Seni</td>
<td>✓</td>
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<tr>
<td>Kajang</td>
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<td>✓</td>
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<tr>
<td>Putra Heights</td>
<td>✓</td>
<td>✓</td>
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</tbody>
</table>

**Keys:**
- ✓ Interchange
- ‡ Interchange within walking distance
4.2.2 Hierarchy of Interchange

A critical part of developing a more integrated land public transport network in Greater Kuala Lumpur/ Klang Valley is the effective integration of urban rail and bus services. It is important to identify the role and functions of stations so that appropriate level of access by bus and other feeders can be provided accordingly.

Table 4.2 provides a definition of the proposed station categories, the designated functions within the overall land public transport network and the proposed access provision.

**Table 4.2: Station Categories and Functions**

<table>
<thead>
<tr>
<th>Station Category</th>
<th>Function &amp; Typical Access Provision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integrated Transport Hub Station</td>
<td>Main integration station between rail lines and intercity (long distance) buses - dedicated provisions also for urban and feeder bus, taxi, kiss and ride, park and ride.</td>
</tr>
<tr>
<td>Regional Hub Station</td>
<td>Main integration station between rail and urban buses - dedicated provisions also for feeder bus, taxi, kiss and ride, limited park and ride.</td>
</tr>
<tr>
<td>Local Hub Station</td>
<td>Main integration station between rail and feeder buses - dedicated provisions also for feeder bus, taxi, kiss and ride, limited park and ride.</td>
</tr>
<tr>
<td>Local Station (City Centre)</td>
<td>Local station - Mainly pedestrian access. No dedicated bus access, served only by wider bus network (i.e. through existing local bus stops).</td>
</tr>
<tr>
<td>Local Station (non City Centre)</td>
<td>Local station - Mainly pedestrian access with taxi and kiss and ride provision. No dedicated bus access, served only by wider bus network (i.e. through existing local bus stops).</td>
</tr>
</tbody>
</table>

Using this approach, each urban rail station will fall into one of the station categories. Table 4.3 provides the station category for some key stations.

**Table 4.3: Station Hierarchy**

<table>
<thead>
<tr>
<th>Interchange category</th>
<th>Stations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integrated Interchange</td>
<td>1) KL Sentral 2) Bandar Tasik Selatan 3) Sg Buloh</td>
</tr>
<tr>
<td>Regional Interchange</td>
<td>4) Kuala Lumpur / Pasar Seni 5) Kajang 6) Putra Heights 7) Putrajaya Sentral 8) Klang</td>
</tr>
</tbody>
</table>
4.2.3 Interchange with the Intercity Transport Network

Integrating the Greater Kuala Lumpur/Klang Valley land public transport network with the Intercity bus and rail network will increase the ability and flexibility of land public transport, so they are not only serving Greater Kuala Lumpur/Klang Valley but also provide efficient linkages with the rest of Malaysia using the followings:

- Interchange with three Integrated Transport Terminals (ITT) at Bandar Tasik Selatan (southbound), Gombak (eastbound) and Sungai Buloh (northbound), intended to disperse long distance bus traffic from entering city centre and provide convenient transfers into city centre via MRT Line 1, KTM Komuter, ERL and Ampang LRT line
- Interchange with Intercity KTM services at Sungai Buloh and Kajang on the northern and southern approaches to KL. This enables more efficient dispersal of traffic by transferring to more appropriate mode/line (i.e. interchange before getting into KL Sentral) and relieve unnecessary patronage converging at KL Sentral
- Interchange with KLIA using existing ERL lines (KLIA Express and KLIA Transit).

4.3 Fares and Ticketing Integration

The main objective is to establish an integrated smart ticketing system that involves cashless mode of payment, across all land public transport operators within the Greater Kuala Lumpur/Klang Valley to provide a seamless journey experience for land public transport users. In longer term the travel fares across all modes need to be integrated with the aim to reduce penalty or additional cost if the passengers have to interchange between modes or services.

More attractive both in terms of convenience and cost perspectives. The availability of one single ticket for the whole journey across all modes with no penalty for interchanging between services will help to expand the travel choice of passengers and encourage more effective dispersal of trips across the whole land public transport network.

Table 4.4 summarise the recommended approaches to be considered in order to enhance fare and ticketing integration:
### Table 4.4: Approach to Enhance Fare and Ticketing Integration

<table>
<thead>
<tr>
<th>Descriptions of Approach</th>
<th>Risk &amp; Challenges</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ticketing Integration (2011-2013)</strong></td>
<td></td>
</tr>
<tr>
<td>To continue and ensure the implementation of the on-going NKRA initiatives on integrated smart ticketing</td>
<td>Many stakeholders need to be engaged; namely MOF, MOT, SPAD, EPU, all land public transport operators</td>
</tr>
<tr>
<td>Touch-n-Go card to be introduced across all land public transport services in Greater Kuala Lumpur / Klang Valley</td>
<td>Require coordination from all involved parties; ministries/agencies - operators - technology providers</td>
</tr>
<tr>
<td>New AFC system to allow customers to buy and reload tickets online</td>
<td></td>
</tr>
<tr>
<td>Aim for single ticketing across all modes and operators - 1 ticket 1 journey</td>
<td></td>
</tr>
<tr>
<td>Comprehensive passenger travel guide and assistance that include information centre, real time information; availability of land public transport information and purchase of tickets online and other convenience shops</td>
<td></td>
</tr>
<tr>
<td><strong>Fares Integration (Post 2013)</strong></td>
<td></td>
</tr>
<tr>
<td>In short term, implementation of fare differentiation between cash and cashless fares (i.e. 10% less for cashless system) to encourage take up of smart tickets</td>
<td>Require cooperation from all land public transport operators to accept a new fare system across all modes and operators</td>
</tr>
<tr>
<td>Fare rebate for journey involves interchange to minimise the interchange penalty from discouraging transfer between services</td>
<td>Buy in from operators to accept fare rebate for interchange</td>
</tr>
<tr>
<td>In longer term aim for distance based or time based fare system, so that there is no interchange surcharge for land public transport users travelling under similar distance or time frame</td>
<td>Distribution of fare between different operators need to be fair and transparent process</td>
</tr>
<tr>
<td>Commuters shall not pay extra if the best routing involves transfer</td>
<td></td>
</tr>
<tr>
<td>Different fares for ‘bus only’ and ‘bus and rail’ pass so that customers are given the flexibility to choose the mode based on their affordability and needs</td>
<td></td>
</tr>
<tr>
<td>Fare system needs to be designed to reward frequent user - significant discounts to be given to annual or monthly pass holders in order to cultivate land public transport customer base</td>
<td></td>
</tr>
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</table>
4.4 Integration with Feeder Modes

A well planned interchange that is properly integrated into its surroundings and supported feeder modes will support efficient land public transport operations. An accessibility strategy for station is intended to provide a general guide to determine the provision of access for other feeder modes such as pedestrian, bus, taxi, kiss & ride and park & ride, so that they are consistent with the roles and functions of the interchange.

Although it is important to plan for as many modes of access as possible, not all modes need to be given equal priority and they have to be rationalised according to the roles and functions of the said interchange in the overall land public transport network. It is therefore crucial to establish a hierarchy of access to prioritise the site planning of interchange and its required facilities. Generally it is recommended that the provision of access be guided by the following hierarchy (see Table 4.5):
Table 4.5: Access Hierarchy

<table>
<thead>
<tr>
<th>Access type</th>
<th>Descriptions of access hierarchy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pedestrian Access</td>
<td>- Highest priority of access</td>
</tr>
<tr>
<td></td>
<td>- Emphasis on safe, comfortable and continuous linkages to and from the walking catchment (i.e. 400m radius) surrounding the interchange</td>
</tr>
<tr>
<td></td>
<td>- Shall form the largest mode access to most interchanges</td>
</tr>
<tr>
<td></td>
<td>- Direct links to and from walking catchment (400m radius) minimising conflicts with other modes</td>
</tr>
<tr>
<td></td>
<td>- Pedestrian access type to suit immediate land use/ geographic conditions of the station (see Table 4.6)</td>
</tr>
<tr>
<td></td>
<td>- Clear lines of sight, proper lighting and adequate pedestrian amenities</td>
</tr>
<tr>
<td>Feeder Bus Access</td>
<td>- Priority over all other vehicle modes</td>
</tr>
<tr>
<td></td>
<td>- Generates high volumes of potential rail passengers</td>
</tr>
<tr>
<td></td>
<td>- Emphasis on safe, comfortable and continuous linkages to and from the walking catchment (i.e. 400m radius) surrounding the interchange</td>
</tr>
<tr>
<td></td>
<td>- Expands the catchment to area within 3km from the rail or bus station/stop</td>
</tr>
<tr>
<td>Taxi/ Kiss &amp; Ride</td>
<td>- Higher priority than park and ride</td>
</tr>
<tr>
<td></td>
<td>- In general this generates higher share of land public transport users per vehicle</td>
</tr>
<tr>
<td></td>
<td>- Adequate facilities like taxi and drop off/pick up lanes to be placed nearer to the station entrances</td>
</tr>
<tr>
<td>Park &amp; Ride</td>
<td>- Lowest priority</td>
</tr>
<tr>
<td></td>
<td>- Lower share of land public transport users per vehicle</td>
</tr>
<tr>
<td></td>
<td>- Generally discouraged but Park &amp; Ride can be provided at selected stations in non-traffic sensitive areas</td>
</tr>
</tbody>
</table>
4.4.1 Pedestrian Accessibility Strategy

The provision of pedestrian access needs to suit the immediate land use surrounding the station within 400m radius walking catchment from the station. The following guidelines describe typical pedestrian to be provided at key stations in the Greater Kuala Lumpur/Klang Valley:

<table>
<thead>
<tr>
<th>Surrounding Land Use</th>
<th>Example Stations</th>
<th>Land Use Definition</th>
<th>Pedestrian Access Provision</th>
</tr>
</thead>
<tbody>
<tr>
<td>City Centre</td>
<td>KL Sentral, Masjid Jamek, Chow Kit, Hang Tuah</td>
<td>Stations within the CPA or city centre or Kuala Lumpur or with high concentration of business activities</td>
<td>Underground pedestrian walkways or fully covered walkway to adjacent developments. Planned pedestrian network within 400m radius pedestrian catchment zone with high quality covered walkway generally provided.</td>
</tr>
<tr>
<td>Major Developments</td>
<td>KL Sentral, KLCC, PWTC, Mid Valley, The Curve, One Utama, Matrade</td>
<td>Stations that are located adjacent to major developments such as shopping centres, mixed development projects</td>
<td>Direct pedestrian access to adjacent development - “punch through” footbridge for all new developments and wherever possible for existing. Covered walkway to nearest taxi/bus stand.</td>
</tr>
<tr>
<td>Commercial Areas</td>
<td>Dataran Sunway, IOI Mall Puchong, Sentul, Subang Jaya, Cheras</td>
<td>Stations that are located adjacent to mainly commercial areas outside the CPA</td>
<td>Planned pedestrian network within 400m radius catchment zone. Covered walkway to commercial area and to nearest taxi/bus stand. Overhead footbridges provided across any major severances in pedestrian catchment zone.</td>
</tr>
<tr>
<td>Residential Areas</td>
<td>Ampang, Cahaya, Pandan Indah, Pandan Jaya, Maluri</td>
<td>Stations that are located adjacent to mainly residential areas</td>
<td>Planned pedestrian network within 400m radius catchment zone. Covered walkway to nearest taxi/bus stand. Overhead footbridges provided across any major severances in pedestrian catchment zone.</td>
</tr>
</tbody>
</table>
4.4.2 Feeder Bus Accessibility Strategy

Since it provides a higher share of land public transport users per vehicle, provision of accessibility to feeder buses is essential. In general the provision of bus links depends on the type of station catchments area, station type, or by types of bus service. However, there is a clear need to put in place adequate accessibility to a station by bus where the bus stop shall be within comfortable walking distance equipped with covered walkway.

Table 4.7 shows the key interchanges with the type of bus accesses they are expected to be provided:

<table>
<thead>
<tr>
<th>Station Category</th>
<th>Integrated Transport Hub</th>
<th>Regional Hub Station</th>
<th>Local Hub Station</th>
</tr>
</thead>
<tbody>
<tr>
<td>Types of bus services</td>
<td>Intercity Buses (long distance)</td>
<td>Urban Buses Feeder Buses</td>
<td>Feeder Buses</td>
</tr>
<tr>
<td>Example station</td>
<td>Bandar Tasik Selatan, Gombak, Sg Buloh, KL Sentral</td>
<td>Kepong (metro Prima), Pasar Seni, Shah Alam, Putrajaya,Kajang</td>
<td>University, Miharja, Maluri, Hang Tuah, Setiawangsa, Ampang, One Utama</td>
</tr>
</tbody>
</table>

4.4.3 Taxi and Kiss & Ride Accessibility Strategy

Taxi and Kiss and Ride accessibility should be provided at all interchange or stations with minor exceptions at city centre stations where local regulations may control the locations of taxi or drop-off lanes.

Dedicated Kiss & Ride drop-off/ pick-up areas and taxi queues need to be orientated to minimize walking distances to station entrances.

In general the broad principles guiding the planning for the bus and taxi drop off and pick up area are as in Table 4.8.
4.4.4

Park and Ride Strategy

The provision of car park at all stations is not possible. Generally driving a car to land public transport interchange in car sensitive area is not actively encouraged as this does not reduce the overall number of car trips but potentially shift congestion to other locations. Nevertheless, in recognition of Park and Ride is still regarded by most car users as one of the most attractive land public transport alternatives (at least for short term), it is proposed that Park & Ride to be provided at strategic key stations at non-car sensitive areas, to serve areas which may not be covered fully by the existing and planned feeder bus services. Car park facilities for the disabled should be located closest to the station entrance.

Major park and ride sites equipped with higher number of car parking spaces are normally sited at line-end stations, while the suburban and city fringe locations are more suitable for secondary park and ride sites where the number of car parking spaces are much smaller. City centre and car sensitive areas (i.e. areas prone to car congestion) are considered not suitable for Park and Ride. Some key interchanges identified with the type of park and ride facilities are set out in Table 4.9.

<table>
<thead>
<tr>
<th>Surrounding Land Use</th>
<th>Example Stations</th>
<th>Provision of bus lay-by</th>
<th>Taxi and Kiss &amp; Ride</th>
</tr>
</thead>
<tbody>
<tr>
<td>City Centre</td>
<td>KL Sentral, Masjid Jamek, Chow Kit, Hang Tuah</td>
<td>Covered walkway to the nearest bus stops</td>
<td>Covered walkway to nearest taxi stand</td>
</tr>
<tr>
<td>Major</td>
<td>KL Sentral, KLCC, PWTC, Mid Valley, The Curve, One Utama, RRIM, Matrade</td>
<td>Lay-by for 2 buses</td>
<td>8 taxi bays per direction of the road (min 110m)</td>
</tr>
<tr>
<td>Commercial Areas</td>
<td>Dataran Sunway, IOI Mall Puchong, Sentul, Subang Jaya, Cheras</td>
<td>Lay-by for 1 bus</td>
<td>3 taxi bays and 3 bays for private vehicles per direction of the road (min 85m)</td>
</tr>
<tr>
<td>Residential Areas</td>
<td>Ampang, Cahaya, Pandan Indah, Pandan Jaya, Maluri</td>
<td>Lay-by for 1 bus</td>
<td>Total 3 vehicle bays (shared by taxi and private vehicles) per direction of the road (min 65m)</td>
</tr>
</tbody>
</table>

Table 4.8: Provision of Bus and Taxi Lay-by

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Table 4.9: Future Park and Ride provision

<table>
<thead>
<tr>
<th>Designation</th>
<th>Description</th>
<th>Example Stations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major Park &amp; Ride Site</td>
<td>Located at line-end stations, 500 spaces per station</td>
<td>Gombak, Selayang, Ampang, Putrajaya, Kelana Jaya, Putra Heights, Bandar Tasik Selatan, Sg Buloh, Klang</td>
</tr>
<tr>
<td></td>
<td>Good road access to station</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Affordable pricing - integrated with land public transport service</td>
<td></td>
</tr>
<tr>
<td>Secondary Park &amp; Ride (Suburban)</td>
<td>Located in non-traffic sensitive suburban areas, 150-450 spaces per station</td>
<td>Kajang, Maluri, Setiawangsa, Shah Alam, Sungai Besi, Bdr Tun Razak, Balakong, Serdang, Kepong, UKM Bangi</td>
</tr>
<tr>
<td></td>
<td>Good road access to stations</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Affordable pricing - integrated with land public transport service</td>
<td></td>
</tr>
<tr>
<td>Secondary Park &amp; Ride (City Fringe)</td>
<td>Smaller car parks (max 100 spaces)</td>
<td>Kota Damansara, PBD, TTDI, Seksyen 16, Maluri, Sentul, Batu Tiga</td>
</tr>
<tr>
<td></td>
<td>Good road access to stations</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Higher price: to manage levels of parking demand and establish bus services as more highly prioritised.</td>
<td></td>
</tr>
</tbody>
</table>

Key Conclusion

In developing the integration strategy the approach is to:

- Significant increase in the number of interchanges on the urban rail network
- Establish a hierarchy of interchange to integrate urban rail and bus services
- Ensure efficient interchange with the intercity transport network

The aim for ticketing integration is to establish an integrated smart cashless ticketing system across all land public transport operators within Greater Kuala Lumpur/Klang Valley. In longer term the travel fares across modes need to be integrated to reduce interchange surcharge.

It is important to develop accessibility strategy to establish hierarchy of access and typical access provision for walking, feeder bus, taxi, kiss & ride and park & ride, so that they are consistent with the role and functions of the interchange.
5 SUMMARY
Chapter 6: Interchange & Integration Plan

SPAD has developed the National Land Public Transport Master Plan (NLPTMP) to set out the vision and direction for land public transport in Malaysia. The purpose is to develop a long term programme to address the current deterioration in land public transport with plans to execute high impact and effective delivery initiatives for a 20-years sustainable national land public transport service.

The NLPTMP outlines the National Land Public Transport Policy which provides guidance and direction towards developing the National Master Plan. Included in the National Land Public Transport Master Plan is also a Planning Guidelines which provides the guidance on the methodology for setting objectives, plan development, identification of policy measures and assessments of solutions. The Planning Guidelines facilitates the development of Regional Master Plans and enables interfacing with State-specific plans and land use policies.

The first Regional Master Plan developed by SPAD is for the Greater Kuala Lumpur/Klang Valley region. The IIP is one of six Subsidiary Plans of the Greater Kuala Lumpur/ Klang Valley Master Plan and relates to interchange and integration in the region. Together these six plans provide an integrated land public transport plan for the Greater Kuala Lumpur/Klang Valley region.

In order to aid the development of the Greater Kuala Lumpur/Klang Valley Master Plan, a series of Guiding Principles have been developed examining issues related to accessibility, capacity, social inclusion and the environment.

The purpose of the IIP is to review the current status of interchange and integration as well as developing guidelines for interchange design and planning. It also identifies the strategy to enhance the integration of land public transport. The Plan focuses on multimodal interchange between one mode of public transport and another, but where appropriate also considers interchange between land public transport and feeder modes such as walking, cycling and motor vehicles.

Currently, there are still rooms for improvement in terms of the provision of interchange between land public transport modes. It is not possible to transfer between rail networks in the Klang Valley without having to first leave the ticket barriers of each individual station. There is however on-going NKRA Urban Public Transport initiatives aimed at improving the integration of land public transport system.

The focus of the guidance is on multi-modal interchange between one mode of land public transport and another land public transport mode. It also considers the interchange between public transport and its ‘feeder’ modes for example walking, motorcycle and private car vehicles. The guidance is intended to supplement the existing standards and other legal and discretionary requirements that apply to planning, design and operation of public transport interchanges, and should be interpreted in the context of these standards.

In line with the Greater Kuala Lumpur/Klang Valley Master Plan, it is anticipated that there will be additional interchange stations on urban rail network, both between the new lines and between the new lines and the existing lines. This will promote convenience for passengers and also creates an operationally more efficient and balanced public transport system.

A well planned interchange that is properly integrated into its surroundings and feeder modes will support efficient land public transport operations and increase the overall convenience and attractiveness of land public transport. An accessibility strategy for station is intended to provide a general guide to determine the provision of access for other feeder modes such as pedestrian, bus, taxi, kiss & ride and park & ride, so that they are consistent with the roles and functions of the interchange.
### List of Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AM hour</td>
<td>For the Greater Kuala Lumpur/Klang Valley area defined as the average morning peak hour between 0700 to 0900</td>
</tr>
<tr>
<td>ANPR</td>
<td>Automatic number plate recognition</td>
</tr>
<tr>
<td>BET</td>
<td>Bus Express Transit</td>
</tr>
<tr>
<td>BRT</td>
<td>Bus Rapid Transit</td>
</tr>
<tr>
<td>BTP</td>
<td>Bus Transformation Plan</td>
</tr>
<tr>
<td>CBD</td>
<td>Central Business District</td>
</tr>
<tr>
<td>CCTV</td>
<td>Closed Circuit Television</td>
</tr>
<tr>
<td>CDL</td>
<td>Commercial Driver's License</td>
</tr>
<tr>
<td>CPA</td>
<td>Central Planning Area</td>
</tr>
<tr>
<td>DBKL</td>
<td>Dewan Bandaraya Kuala Lumpur (Kuala Lumpur City Hall)</td>
</tr>
<tr>
<td>DO</td>
<td>Development Order</td>
</tr>
<tr>
<td>DVLA</td>
<td>Drivers Vehicle Licensing Agency</td>
</tr>
<tr>
<td>EPP</td>
<td>Entry Points Projects</td>
</tr>
<tr>
<td>EPU</td>
<td>Economic Planning Unit</td>
</tr>
<tr>
<td>ERP</td>
<td>Electronic Road Pricing</td>
</tr>
<tr>
<td>ETP</td>
<td>Economic Transformation Programme</td>
</tr>
<tr>
<td>GDP</td>
<td>Gross Domestic Product</td>
</tr>
<tr>
<td>GIS</td>
<td>Geographic Information System</td>
</tr>
<tr>
<td>GKL/KV</td>
<td>Greater Kuala Lumpur and Klang Valley</td>
</tr>
<tr>
<td>GPS</td>
<td>Global Position System</td>
</tr>
<tr>
<td>GTP</td>
<td>Government Transformation Programme</td>
</tr>
<tr>
<td>HOV</td>
<td>High Occupancy Vehicle</td>
</tr>
<tr>
<td>IIP</td>
<td>Interchange and Integration Plan</td>
</tr>
<tr>
<td>IJUTT</td>
<td>Inter Urban Transport Terminal</td>
</tr>
<tr>
<td>ISF</td>
<td>Improvement Service Fund</td>
</tr>
<tr>
<td>ITS</td>
<td>Intelligent Transport System</td>
</tr>
<tr>
<td>JICA</td>
<td>Japan International Cooperation Agency</td>
</tr>
<tr>
<td>JPJ</td>
<td>Jabatan Pengangkutan Jalan</td>
</tr>
<tr>
<td>KLCP</td>
<td>Kuala Lumpur City Plan</td>
</tr>
<tr>
<td>KLCC</td>
<td>Kuala Lumpur City Centre</td>
</tr>
<tr>
<td>KLIJA</td>
<td>Kuala Lumpur International Air Port</td>
</tr>
<tr>
<td>KPI</td>
<td>Key Performance Index</td>
</tr>
<tr>
<td>KTM</td>
<td>Keretapi Tanah Melayu</td>
</tr>
<tr>
<td>KTMB</td>
<td>Keretapi Tanah Melayu Berhad</td>
</tr>
<tr>
<td>LA</td>
<td>Local Authority</td>
</tr>
<tr>
<td>LCCT</td>
<td>Low Cost Commercial Terminal</td>
</tr>
<tr>
<td>LDP</td>
<td>Lebuhraya Damansara Puchong</td>
</tr>
<tr>
<td>LPT</td>
<td>Land Public Transport</td>
</tr>
<tr>
<td>LTABL</td>
<td>Lapangan Terbang Antarabangsa Bayan Lepas</td>
</tr>
<tr>
<td>LTSI</td>
<td>Lapangan Terbang Sultan Ismail</td>
</tr>
<tr>
<td>LPKP</td>
<td>Lembaga Perlesenan Kenderaan Perniagaan (also known as CVLB)</td>
</tr>
<tr>
<td>LPSI</td>
<td>Lapangan Terbang Sultan Ismail</td>
</tr>
<tr>
<td>LRT</td>
<td>Light Rail (or Rapid) Transit</td>
</tr>
<tr>
<td>LUP</td>
<td>Land Use Plan</td>
</tr>
<tr>
<td>MOF</td>
<td>Ministry of Finance</td>
</tr>
<tr>
<td>MOW</td>
<td>Ministry of Works</td>
</tr>
<tr>
<td>MPPJ</td>
<td>Majlis Perbandaran Petaling Jaya</td>
</tr>
<tr>
<td>MRR</td>
<td>Middle Ring Road</td>
</tr>
<tr>
<td>MRT</td>
<td>Mass Rail (or Rapid) Transit</td>
</tr>
<tr>
<td>NGV</td>
<td>Natural Gas Vehicle</td>
</tr>
<tr>
<td>NKEA</td>
<td>National Key Economic Areas</td>
</tr>
<tr>
<td>NKRA</td>
<td>National Key Results Area</td>
</tr>
<tr>
<td>NPP</td>
<td>National Physical Plan</td>
</tr>
<tr>
<td>SMS</td>
<td>Short Messaging Service</td>
</tr>
<tr>
<td>SPAD</td>
<td>Suruhanjaya Pengangkutan Awam Darat</td>
</tr>
<tr>
<td>SPNB</td>
<td>Syarikat Prasarana National Berhad</td>
</tr>
<tr>
<td>Pjc</td>
<td>Perbadanan Putrajaya</td>
</tr>
<tr>
<td>PSL</td>
<td>Parking Space Levy</td>
</tr>
<tr>
<td>PMR</td>
<td>Performance Monitoring Regime</td>
</tr>
<tr>
<td>PPHPD</td>
<td>Peak Passenger per Hour per Direction</td>
</tr>
<tr>
<td>PSV</td>
<td>Public Service Vehicle</td>
</tr>
<tr>
<td>PTP</td>
<td>Public Transport Plan</td>
</tr>
<tr>
<td>PWD</td>
<td>People with Disability</td>
</tr>
<tr>
<td>P&amp;R</td>
<td>Park and Ride</td>
</tr>
<tr>
<td>RTPI</td>
<td>Real Time Information</td>
</tr>
<tr>
<td>RUC</td>
<td>Road User Changing</td>
</tr>
<tr>
<td>TDM</td>
<td>Travel demand management</td>
</tr>
<tr>
<td>TDMP</td>
<td>Travel demand management Plan</td>
</tr>
<tr>
<td>TFL</td>
<td>Transport for London</td>
</tr>
<tr>
<td>TLC</td>
<td>Taxi Licensing Commission of New York</td>
</tr>
<tr>
<td>TOD</td>
<td>Transit Oriented Developments</td>
</tr>
<tr>
<td>TPZ</td>
<td>Transit Planning Zone</td>
</tr>
<tr>
<td>TRS</td>
<td>Transit Restrainment System</td>
</tr>
<tr>
<td>TTP</td>
<td>Taxi Transformation Plan</td>
</tr>
<tr>
<td>TRX</td>
<td>Tun Razak Exchange (formerly known as Kuala Lumpur International Financial District, KLIFD)</td>
</tr>
<tr>
<td>UPEN</td>
<td>Unit Perancangan Ekonomi Negeri</td>
</tr>
<tr>
<td>URDP</td>
<td>Urban Rail Development Plan</td>
</tr>
<tr>
<td>VMS</td>
<td>Variable Messaging Systems</td>
</tr>
<tr>
<td>WPL</td>
<td>Workplace Parking Levy</td>
</tr>
<tr>
<td>WPP</td>
<td>Workplace Parking</td>
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</tbody>
</table>
GREATER KL/KLANG VALLEY LAND PUBLIC TRANSPORT MASTER PLAN

MOBILITY > URBANITY > ECONOMIC GROWTH

Linked to shape the future