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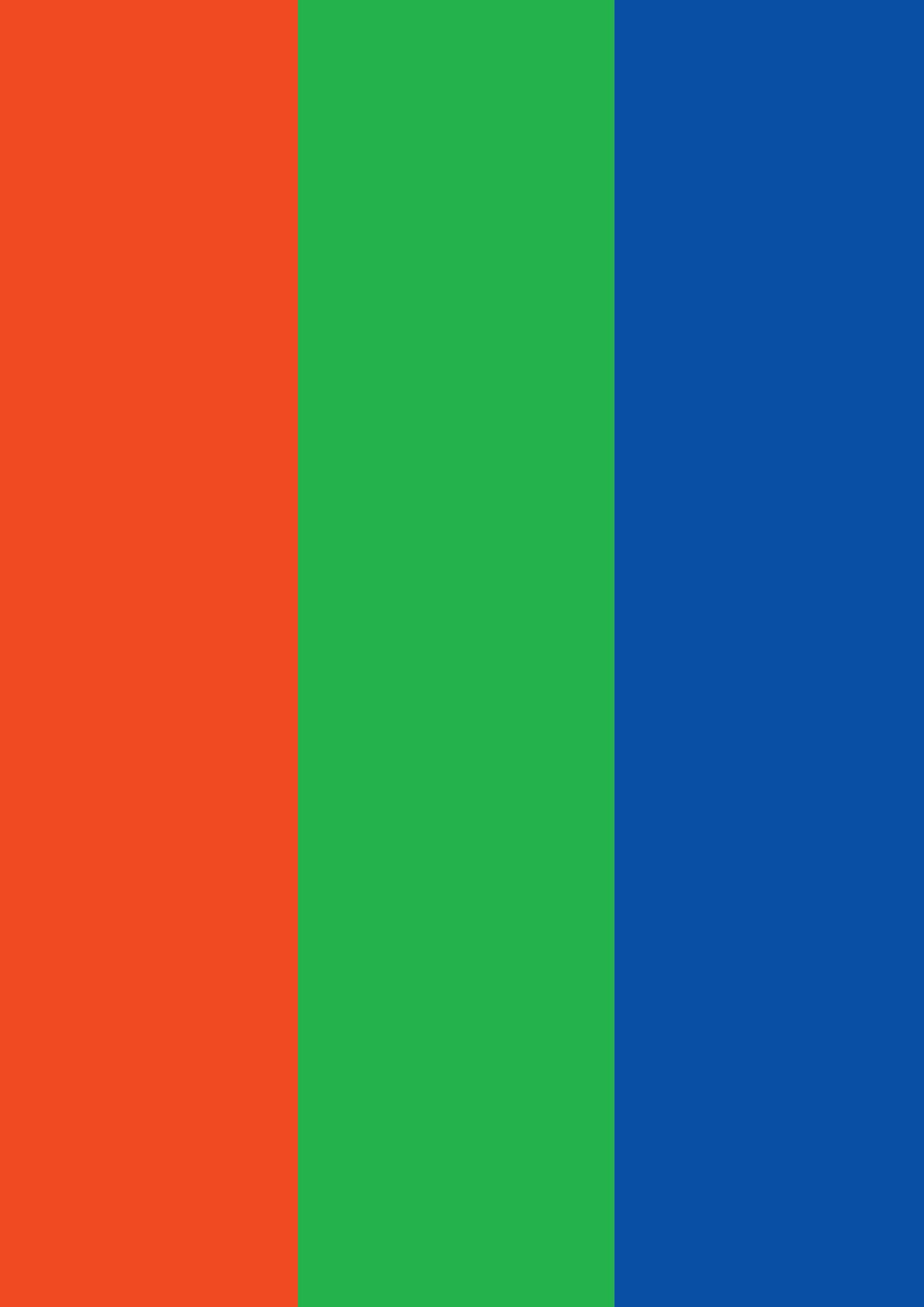
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Ministry of Housing and Local Government, Malaysia

PLANNING IN
GREEN

Malaysian town plan



Federal Department of Town and Country Planning, Peninsular Malaysia
Ministry of Housing and Local Government, Malaysia



Malaysian townplan

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MALAYSIAN TOWNPLAN

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MALAYSIAN TOWNPLAN
NOVEMBER 2010

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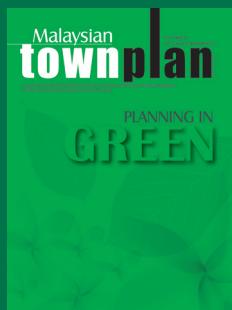
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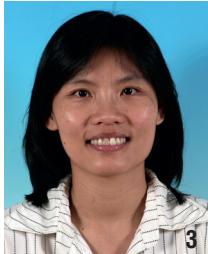
Welcome to Green! Over 30 years ago, we had an interesting student debate about a particular Green Party. Hmm. We were in wonderment about this emerging new political party in Europe, would anybody ever win on an 'environment' ticket, we thought. Besides, it was pretty random then, who would be plucky enough to stand for election on a Green Party platform - a long shot! (in the late 70's). But look who's talking now, all over the world people are talking green... 'suddenly they all came galloping for green!' The wave of green agenda had indeed hit us: green growth, green cities, green technology, green dollars, green industries, green transport, green cars, green buses, and they come in so many shades of green. Even in our yard we have the Ministry of Green Technology and Water. And suddenly there's this endless invitation to green workshops, seminars and conferences that has capitalized, nevertheless enriched the subject matter. Many governments now have their own version of Green Cities, Low Carbon Cities and Eco Cities with many followers and wannabes. We talk about the Green Neighbourhood Index and the Green Building Index in all its scientific orientation and technicalities (by the way my grandmother's house has the best GBI!). And on the debate on cost, as much as Green Tech is expensive, there are also other humble and cost effective methods to achieve the green agenda. I stumbled upon an amusing comment on the web, a lament perhaps, Quote: 'we should not fool ourselves with the names like 'green', and 'sustainable development'. I have seen a few of funny names... When you travel, you get a small plastic wafer bottle with the name 'Nature's spring'. How is plastic going to help nature? Some of the funny names of the townships created after cutting forests and constantly occupying valuable lands, and using unsustainable method and energy in the urban outskirts are called 'Eco City' 'Ocean park', 'Green City' and other names pretending to be green;' Unquote. Hmm....

And there is poetry in green. The moving but now cliché Earth Song becomes an icon for the prosperity of green consciousness. So does the rendering of our local 'Hijau', also check out this oldie by Chris Rhea – 'Road to Hell'. The instilling of green consciousness had come in various fashion and threshold of pain. Those days eco-warriors tie themselves to trees to protect trees from being cut to accommodate a road by-pass and Greenpeace militants espionage to protect. Nowadays, you can become an eco-warrior just by collecting rainwater for domestic use in your homes, you can become an eco-warrior by consciously switching off lights when you leave a room, join the crop-mobs to help in the nearest neighbourhood urban vegetable patch project or just plain ignoring the plastic bag. Slowly but surely, the green movement and 'green conscience' is making its mark in healing the earth.

By the way, does anybody remember that Sci-fi biscuit movie - Soylent Green?

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GREEN NEIGHBOURHOOD AS AN INITIATIVE TOWARDS SUSTAINABLE DEVELOPMENT IN MALAYSIA



ABSTRACT

Malaysia continuously supports initiatives in implementing sustainable urban development strategies including 'green growth' and green urbanism. This paper outlines some initiatives towards developing green neighbourhoods in Malaysia highlighting related policies that have been formulated at various levels of development plans including planning guidelines that support green urbanism. Development Plans in Malaysia have long recognized the need for green strategy by way of conservation, promoting green networks in urban neighbourhoods, promoting walkability and sustainable public transport. Currently, this has been value-added by incorporating design dimensions related to energy efficiency towards a low carbon society. The role of the community is also highlighted as it is instrumental in supporting green neighbourhood initiatives.

INTRODUCTION

The concept of 'environmental sustainability' was first brought to widespread public attention in 1972 embodied in the book *'The Limits to Growth'*. The report basically concluded that the growth of the human population, and an increase in prosperity, would cause an ecological collapse within the 50 years. This was followed by the Brundtland Report in 1987 and the Rio Declaration in 1992, Kyoto Protocol in 1997 and Stern Review in 2007 which had spurred strategies for action towards achieving sustainable development and consequential initiatives in sustainable communities, green development and green cities to adapt to environmental degradation, climate change and a carbon constrained future.

GREEN AGENDA THROUGH SUSTAINABLE CITIES AND NEIGHBOURHOODS

Cities are actively making changes to become more sustainable, often aiming to promote development that is contained within its ecological carrying capacity, a development which is socially just and economically inclusive. The concept of sustainable development was consequently extended into 'green development', synonymous to 'green urbanism'. Green urbanism presents fundamental opportunities to shape cities to be more sustainable, bringing about major lifestyle changes such as walking, cycling and reduction of consumptive communities, with provisions to boost renewable energy, energy efficiency and environmental restoration. Among features are high-performance green buildings (extended spatially into high-performance green townships) with investments in public transport and other sustainable transport measures and research into new technologies. Indeed, it is the cities that hold the greatest hope for achieving a more sustainable future for our planet. By 2030, over 60 percent of the world's population (4.9 billion out of 8.1 billion people) will live in cities¹. **Thus any effective agenda to reduce the impacts of climate change and other environmental challenges must necessarily include cities as a key element.**

Though there are many earlier historic references to the garden city, the

implementation of 'green' element in modern physical planning can be traced back from Sir Ebenezer Howard in 1898 through his concept of the 'garden city'. These were well-planned, self-contained, communities surrounded by green belts, containing carefully balanced areas of residences, agriculture and industries. With environmental issues on the forefront, development is increasingly focusing on green elements to directly or indirectly reduce green house gases (GHG). Thus, the garden city concept has expanded and enhanced to resolve environmental challenges as well. In its wider interpretation, green development has been described as a land use planning concept that includes consideration of community-wide implications of development, as well as site-specific green building concepts. This involves city planning and environmental planning, urban design, architecture and community building. Sustainable neighbourhoods would then become the basic module in green urban planning, forming green cities and green regions.

CHARACTERISTICS OF GREEN CITIES AND GREEN NEIGHBOURHOODS

Beatley, T. (2000), described that cities that exemplify green urbanism are characterized as follows:

- they strive to live their ecological limits, fundamentally reduce their ecological footprints, and acknowledge their connection with and impacts on other cities and communities and the larger planet;
- they are designed for and function in ways analogous to nature;
- they strive to achieve a circular rather than a linear metabolism, which matures and develops positive symbiotic relationships with and between its hinterland (whether that be regional, national, or international);
- they strive towards local and regional self-sufficiency and take full advantage of nurturing local/ regional food production, economy, power production, and many other activities that sustain and support their population;
- they facilitate (and encourage) more sustainable, healthful lifestyles; and
- they emphasize a high quality of life and the creation of highly liveable neighbourhoods and communities.

¹ UN-Habitat 2001

From those criteria given, a Green township can be conceived as an integrated planned habitat that gives emphasis on the protection, use and recycling of natural resources, besides promoting public health, safety and general welfare of urban people. Key characteristics of future Green Cities is that they are waste free, transport efficient with widely available public transportation, walkable and cycle-friendly, wholly energy independent with minimal carbon output including reduction of fossil-fuel use, adopt sustainable building practices, promote "green space" and parks as 'lungs of the cities' and clean air quality, implement energy-efficient initiatives and develop well-organized mixed-use neighbourhoods that combine living, working and shopping. Instrumental to green urbanism is the community network and cohesion, green consciousness and commitment.

The neighbourhood as a basic module in developing green cities becomes the front line in incorporating efforts into designs and activities to reduce greenhouse gas emissions while meeting a host of other community goals. As the quality of people's homes is influenced by the spaces around them, there is an increasing recognition that well-designed, well-managed green spaces by and in between housing are crucial to making neighbourhoods liveable, and contribute to people's quality of life. Green elements such as the network of green spaces and corridors, tree-lined streets, significant private landscaping (including green roofs) or even small scale local community agriculture are examples of good green applications. Thus, buildings in the neighbourhood are often "green" with excellent environmental performance; area-wide green infrastructure is common place, from low-impact storm water management to district energy systems. Most important in planning a green neighbourhood is creating the vision, giving policy directions and guidelines that describe all aspects necessary of a green neighbourhood towards achieving its set of goals. Making a commitment to neighbourhood designs that will support a low- emission lifestyle for all residents, would involve the widest possible range of stakeholders and community support to set up

and maintain internal systems to ensure continued improvements and refinements as the plan is being implemented.

GREEN NEIGHBOURHOOD GUIDELINES

Since the mid 1990's, the Ministry of Housing and Local Government Malaysia through the Federal Department of Town and Country Planning has taken the initiatives and efforts to promote green urbanism through the National Urbanisation Policy (NUP) prior to the establishment of the National Green Technology Policy (NGTP). This serves as a support to follow-through the green growth agenda. Currently, the Department is preparing Green Neighbourhood Guidelines to guide the States and Local Authorities, developers, architects, planners, engineers and the public to plan and design green neighbourhoods towards creating a Low Carbon Society (LCS) thus meeting the objectives of sustainable development.

In tandem with the preparation of the Green Building Index, a local version of the Green Neighbourhood Index (GNI) shall also be developed. The framework for green rating system for single buildings can be further extended to a neighbourhood level to create a green rating system for neighbourhoods. GNI a new approach to the greening and sustainability assessment of the built environment that will assist developers and local planners to address green objectives and planning system requirements at the early planning stage for development projects. The assessment is linked to Green Neighbourhood Guidelines and core planning policy requirements to support the delivery of national, regional as well as local policy targets.

DESIGN CRITERIA FOR GREEN NEIGHBOURHOOD²

"A green neighbourhood meets the needs of people's daily activities and allows communities to control pollution, save energy, increase employment, decrease crime rates, develop friendships, practice on-site renewable energy methods, and preserve agricultural and environmentally sensitive areas. Akin to

² Derived from literature review and the Federal Department of Town and Country Planning Research Team.

an efficient network, communities can easily access their homes, work places, public facilities, transit facilities and green spaces within comfortable walking scale.”

Design criteria include the following:

1. Smart Location - Priority should be given to locating new development on vacant land (infill sites) within the city, within suburban neighbourhoods, and unused sites or contaminated sites (brownfields) while limiting the expansion of the development footprint in the region to appropriate circumstances. Environmentally Sensitive Areas should be avoided .

2. Neighbourhood Pattern and Design

- **Walkable**
- **Cycling Environment** – Create routes through parks and other open spaces, and connect to the local street network. Bicycle should be stored in secure and weather protected areas.
- **Highly Diverse** with mixed use development and mixed income community.
- **Community Centres** – Place making which creates a sense of belonging.
- **Compact** – Should be compact with moderate to high density to accommodate more people while maintaining comfortable human scale and offer diversity of local facilities and transit services.
- **Interconnected Street Network and narrower roads** – Provide efficient internal accessibility and good external connections for walking and cycling environment with traffic management to restrain vehicle speed and minimise the impact of through traffic.
- **Parking Management** – Discourage the provision of excess parking, particularly in large surface parking lots, to promote compact development, preserve open space, avoid surface run-off and reduce auto dependence.
- **Green Open Space Network** – Encourage the provision of additional green spaces and amenity areas that are accessible to the public and developed with features to enhance recreational opportunities.
- **Local Food Production** – Vacant spaces such as infrastructure

reserves can be allocated for the local community/neighbourhood to use to support local farming and promote urban agriculture.

3. Green Infrastructure

Low Impact Development (LID) – Promote the use of LID stormwater management strategies to reduce run-off and improve water quality in the treated run-off.



Rain Water Harvesting – Develop integrated rain water harvesting to secure water resources and avoid flooding. Planning layouts shall incorporate rainwater storage tanks for residential, institutional, commercial and industrial buildings.

Green Roof – Transpiration from vegetation has greater cooling effect. Roof top garden creates more open spaces for the urban area.

District Cooling System – Dedicate District Cooling System reserve as central plant to supply chiller water for air-conditioning serving multiple buildings rather than installation of cooling system in each building.

On-site Renewable Energy Sources – Incorporation of natural day-lighting into building design to save energy and installation of photovoltaic or solar panel into industrial, commercial, residential and common buildings.

Green vehicles – Promote preference for electric vehicles and hybrids

Green Communities Network – Public involvement in neighbourhood planning and design process through community discourse and social media.

POLICIES RELATED TO THE PLANNING OF GREEN NEIGHBOURHOODS IN MALAYSIA

The Malaysian government has been continually promoting environmental stewardship in all development plans. Since the Eighth Malaysia Plan (2001-2005), the incorporation of environmental consideration into planning and development has been intensified. Consequently, the sustainable use of energy has been identified in the 9th Malaysia Plan, highlighting strategies for using energy efficiently through the promotion of greater use of renewable energy for power generation by industries and intensifying energy efficient initiatives in the industrial, transport and commercial sectors as well as applications in government buildings. The 10th. Malaysia Plan reinforces and places further emphasis on the use of renewable energy and on increasing energy efficiency. Various measures such as relevant guidelines, standards and laws would be introduced to ensure efficient use of energy and to reduce greenhouse gas emission.

In tandem with the Malaysia Plans and other national policies, the Ministry of Housing and Local Government of Malaysia through its Department of Town and

Country Planning, had translated these into spatial form through the National Physical Plan (NPP) and the National Urbanisation Policy (NUP).

National Physical Plan (NPP)

First approved by the National Physical Planning Council in 2005, the goal of the National Physical Plan (NPP) is to establish an efficient, equitable and sustainable national spatial framework to guide the overall development of the country towards achieving developed nation status by 2020. The NPP is prepared in accordance with the provisions of the Town and Country Planning Act 1976 (Act 172). Selected policies supporting the green urbanism concept and initiatives are summarized as follows:

- a) promoting transit oriented development (TOD) concept as the basis of urban land use planning to ensure viability of public transport, supported by walkways linkages to promote connectivity and to reduce emissions. These walkways linkages shall connect to railway stations to other major landmarks or developments in the town centres.
- b) all urban settlements will be serviced by an integrated network of solid-waste disposal and/or recovery facilities. Waste generation management will be promoted including recycling of waste, solid waste collection and disposal in accordance with the National Solid Waste Master Plan.
- c) as strategic assets, electricity generation plants and distribution mains shall be suitably located to provide a reliable and efficient supply of power to consumers. Renewable energy such as energy from solar, wind, wave and biomass are to be promoted to complement traditional power generation sources.

National Urbanization Policy

In addition to the National Physical Plan which demonstrated physical planning commitment to support green urbanism, green urbanism has also been reflected in the Malaysia's National Urbanisation Policy (NUP) approved by the Cabinet on August 8, 2006. The NUP guides and coordinates planning and urban development in Malaysia incorporating key areas such as urban growth limit,

compact cities, urban regeneration, utilization of open spaces, solid waste generation/containment, sustainable transport, energy efficiency and renewable energy. The National Urbanization Policy emphasizes the following:

- i. optimal and balanced landuse planning emphasis in urban development, hence all development shall be compatible with the surrounding landuses and concentrated within the urban growth limit so as to create a compact city
- ii. encouragement of re-development programmes for brownfield areas and promotion of urban regeneration
- iii. adequate provision of open space and recreational areas to meet the requirement of the population, consequently promoting the contiguous and integrated development of green areas in urban centres to reduce carbon emission
- iv. develop an integrated, efficient and user-friendly public transportation system including environmental friendly vehicles, bicycle lanes, and pedestrian network to for efficient connectivity and to reduce the level of air pollution
- v. effective and sustainable solid waste and toxic management systems to effect solid waste reduction, full utilization of bio-degradable materials and encourage recycling programmes for the community
- vi. strategies related to sufficient housing and affordability, taking into account the needs of various groups of society including the disabled and senior citizens
- vii. environmental conservation and improving the urban quality of life,
- viii. encourage development that reduces the impact of urban heat islands and to ensure that urban development will take into account reduction of air, noise and water pollution
- ix. Use of innovative technology in urban planning, development and urban services management aiming to reduce the production of waste, promote the construction of green buildings and encourage the use of efficient energy and renewable energy

Indeed, the urban planning fora had conceived ways to promote green

urbanism since the mid 1990's and was formalized in the National Urbanization Policy during the early period the 9th Malaysia Plan. Subsequently, initiatives in the National Green Technology Policy (NGTP) serve as a support to follow-through the green growth agenda.

Planning Guidelines and Circulars

In addition to policy directions and prescriptions in the National Physical Plan and National Urbanization Policy, there are other initiatives to encourage green township implementation. Among these are:

a) Planning Guideline for Open Space and Recreation Facilities

This guideline first prepared in 1997 had aimed to guide local authorities and developers to provide adequate open spaces at various levels of hierarchies, locations, sizes and facilities. It also highlights the requirement to provide a minimum of 10% of usable open spaces for all types of developments. This guideline is being reviewed by the Federal Department of Town and Country Planning.

b) Planning Guideline for Roof Top Gardens

With current rising concerns to reduce carbon footprint, the green roof becomes an adaptation measure in a changing climate. The Federal Department of Town and Country Planning has drafted the Planning Guidelines for Roof Top Garden in 1997 and is currently being reviewed and updated. Originally conceived as part of the open space planning in the urban areas to fully utilize idle spaces, rooftops are now providing opportunities not only in beautification but in energy saving, insulation and air quality improvement and for reducing the effects urban heat island. Currently there are successful examples of roof top gardens in shopping malls. These gardens adopt recycling technologies such as chilled water irrigation sourced from the shopping centre's air conditioning system to grow temperate plants and a rainwater harvesting system for general irrigation. As an example, plants can be grown on a soil-mix based on granulated horticultural carbon.



A backyard rainwater harvesting system in Sandakan.

c) The Circular from the Secretary-General, Ministry of Housing and Local Government on Rain Water Harvesting System, 1999 (SPAH)

Forward looking, the Cabinet had, in 1998, instructed the Ministry of Housing and Local Government to promote the use of rainwater. This was prior to the formulation of the Policy on Climate Change in Malaysia. Subsequently, the Ministry of Housing and Local Government had produced a Circular in 1999 to instruct local authorities to install a Rain Water Harvesting System (SPAH, Sistem Penuaian Air Hujan) in buildings. A success story in implementing the rainwater harvesting system, the Municipality of Sandakan, Sabah, had imposed a planning requirement in development applications to provide a rainwater storage tanks for new residential building commencing June 2001. Each tank is able to store a maximum of 400 gallons of rainwater. Further guidelines had been prepared to support this circular.

RESEARCH INITIATIVES

Low Carbon City Research

Green Urbanism being the current buzz-word had rendered numerous interests from various Government Ministries, Institutes of Higher Learning and Local Authorities into various research aspects and pilot projects. The Federal of Town and Country Planning Department (FTCPD) had identified the Low Carbon City concept as one of its research initiatives since the 9th Malaysia Plan and had produced related guidelines including one on Sustainable Transportation in Landuse Development in 2005. In a wider context, FTCPD is currently

collaborating with a research team from Kyoto University Japan and University Technology of Malaysia (UTM) in conducting a research on Low Carbon City. The Iskandar Development in Johor has been selected as a pilot and tagged as "Low Carbon City 2025, Sustainable Iskandar Malaysia". This study researches the feasibility of developing Iskandar Malaysia into a low carbon city. The methods involved developing the current inventory of GHG emissions of Iskandar Malaysia; and quantifying the social economic activity level in 2025 based on Iskandar Malaysia's Comprehensive Development Plans. Initial findings had shown that the GHG emissions of Iskandar Malaysia will increase 3.6 times higher than of the level at 2005 without mitigation measures, and by adopting the mitigation options, emissions can be reduced by approximately 60% by 2025.

OTHER NATIONAL POLICIES

The National Green Technology Policy (NGTP) July 2009

The NGTP is one of the most current platforms supporting green growth. It introduces and proposes the implementation of innovative economic instruments, as well as the establishment of effective fiscal and financial mechanisms to support the growth of green industries. The NGTP is held by four pillars namely energy; environment; economy; and social with four key areas focusing on energy, building, water & waste management and transportation. These can be summarized as follows:

i) Energy Sector

Energy Supply Sector: Application of Green Technology in power generation and in the energy supply side management, including co-generation by the industrial and commercial sectors, and Energy Utilisation Sector. Application of Green Technology in all energy utilisation sectors and in demand side management programmes.

ii) Buildings Sector

Adoption of Green Technology in the construction, management, maintenance and demolition of buildings.

iii) Water and Waste Management Sector

Technology in the management and utilisation of water resources, waste water treatment, solid waste and sanitary landfill; and

iv) Transportation Sector

Incorporation of Green Technology in the transportation infrastructure and vehicles, in particular, biofuels and public road transport.

These areas are expected to promote foreign direct investments (FDI) on green technology to foster domestic direct investments (DDIs) and local industry participation. Implications on green neighbourhoods have been identified through 2 strategic thrusts in the NGTP. The first thrust focuses on providing conducive environment for green technology development with measures to strengthen the understanding of local players in Green Technology industries and their value chain. This would include technology and infrastructure support required for energy efficient neighbourhoods and cities. Similar to economic strategies adopted by many countries, the NGTP facilitates and infuses funds into sustainability-oriented projects simultaneously greening the economy. The second thrust in the NGTP is to promote education and information dissemination through comprehensive roll-out programmes to increase public awareness on Green Technology.

Malaysian Budget 2010 and 2011

The topic of green growth continues when the Prime Minister, during his 2010 Budget speech in October 2009, announced that Malaysia will develop green technologies and encourage development of green buildings. The development of green technology would be translated by developing Putrajaya and Cyberjaya as pioneer townships in green technology and as a showcase for the development of other townships. These green townships would promote well connected neighbourhoods, reduce carbon footprint through environmentally friendly initiatives including green buildings and using resources efficiently. These townships should also be well managed, inclusive and equitable and fostering a sense of community within a thriving and vibrant economy.

Consequently, the 2011 Budget had committed to developing green technology whereby the government shall continue to provide incentives by way of pioneer status and investment tax allowance for the generation of energy sources and energy efficient activities and initiatives.

The National Policy on Climate Change

The National Steering Committee on Climate Change (NSCCC) serves as the national focal point for external financial and technical assistance for climate change programme. The NSCCC also formulates and implements climate change policies including mitigation of GHG emissions and adaptation to climate change. Though debates and discourses in climate change had taken place prior to the formulation of The National Green Technology Policy, the submission of the National Green Technology Policy had preceded the submission of National Climate Change Policy to the Cabinet in November 2009. This policy will drive efforts to reduce emissions and contribute to the larger agenda of reducing climate change impacts. The Blueprint comprises five (5) principles, ten (10) strategic thrusts and forty-three (43) key actions, all focusing on mitigation, adaptation measures and capacity building. In December 2009 at the COP-15, the Prime Minister had announced that Malaysia will adopt a voluntary national reduction up to 40% in terms of GDP emission intensity by year 2020. The Ministry of Natural Resources and Environment (NRE) is currently finalizing the road map for Malaysia to achieve the national target reduction of GHG emission by 2020.

PUBLIC AWARENESS AND GREEN CONSCIOUSNESS

One of the keys to successful greening of a neighbourhood is the commitment of the community in realizing their green objectives. Fundamental to community commitment is awareness, more so, green consciousness towards shared community goals. Often an uphill climb, communication, partnership and sharing between all members of the community are instrumental in the creation of successful green cities. Promoting an area-wide green lifestyle such as

recycling, waste reduction, working on urban community agricultural plots or community gardens, or even participating in a composting program or eco-festival for example, are green community activities that require collective synergy. Other green lifestyle changes that would be driven by community rapport are walking, cycling, and initiatives related to the use of household and community green technology. Green technology vendors play an important role in shaping green cities but the bottom line is that green urbanism is community-led. Though green networking is maturing in Europe through the social media and internet portals, Malaysia is new in these efforts. However, long existing platforms can be used, such as Local Agenda 21 and thus far some activities on greening such as recycling have been realized through Malaysia's Local Agenda 21 under the Ministry of Housing and Local Government.

At the Local Authority level, Green Neighbourhoods Network could create public-private partnership, with Local Authorities developing a community-based stewardship programs with 'community helping community' whereby communities share experiences, volunteer and help each other in creating green environments.

CONCLUSION – THE WAY FORWARD

Global warming and world climate change had impacted people's life in varying degrees. Sustainable development and the greening of living habitat has increasingly become one of the most prominent agenda globally. It is estimated that around 50%³ of the world's population now lives in cities and urban areas and increasingly so in years to come. These large communities provide both challenges and opportunities for environmentally conscious urban makers to make cities more sustainable, particularly at the township and neighbourhood level. This would involve making a commitment to neighbourhood designs that will support a low emission life style for all residents; involving the widest possible range of stakeholders in green growth with green infrastructure serving as a backbone to support energy efficiency and renewable energy within the water and energy systems.

³ According to Central Intelligence Agency (CIA), USA- <https://www.cia.gov/library/publications/the-world-factbook/fields/2212.html?countryName=World&countryCode=xx®ionCode=oc&#xx:>

urban population: 50.5% of total population (2010)
rate of urbanization: 1.85% annual rate of change (2010-15 est.)

ten largest urban agglomerations: Tokyo (Japan) - 36,669,000; Delhi (India) - 22,157,000; São Paulo (Brazil) - 20,262,000; Mumbai (India) - 20,041,000; Mexico City (Mexico) - 19,460,000; New York-Newark (US) - 19,425,000; Shanghai (China) - 16,575,000; Kolkata (India) - 15,552,000; Dhaka (Bangladesh) - 14,648,000; Karachi (Pakistan) - 13,125,000 (2009)

Thus an integrated approach linking all dimension of sustainability is instrumental. On the economic front, green development directly nurtures green economy. Infusing funds into sustainability-oriented projects is one way to 'green' the economy and as had been highlighted by the National Green Technology Policy.

Long-term visions in spatial planning to secure progressively green neighbourhoods, township and regions for sustainable futures calls for a continuous improvement in the development plan making process to consciously include green urbanism. The Ministry of Housing and Local

Government through the Federal Department of Town and Country Planning (FDTCP) has, since the mid 1990's supported green urbanism through its policies and guidelines. Likewise the collective support of local authorities, developers, planners and architects, and related agencies in the public and private sectors in the conception and realization of green neighbourhood and township is instrumental. With visions and policies in place, green urbanism is at best community-driven with community support and consciousness often supported by an effective social networking media and under the auspices of good green leadership.

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Country Planning, Malaysia



ABSTRACT

This paper introduces perspectives in approaches for the adaptive-reuse of various types of ex-mining land within the context sustainable development and planning principles. It further highlights the prospects of redevelopment of ex-mining land within the current planning guidelines that have been developed by the Federal Department of Town and Country Planning. A specific reference to the planning guidelines on the development of brownfield areas is made, indicating the types of uses allowed (with conditions) for selected ex-mining land including mixed-development, areas for recreation, agriculture and development, conservation and research and initiatives that promotes heritage. The guideline on environmentally sensitive areas which has a bearing on the development of ex-mining land is also highlighted. It focuses on the precautionary approach in development, addressing the development of mining areas in the context of community safety, geo hazards, and compatibility with surrounding needs, development impacts and disaster risk reduction. This paper also highlights successful examples on the re-use of ex-mining lands as well as constraints in their development.

INTRODUCTION

Tin mining is one of the oldest industries in Malaysia that have started since 1820s after the arrival of Chinese immigrants. These mining activities have resulted in about 113,700 hectares of tin tailings throughout the peninsula (Ashraf, Mohd. & Yussof, 2008) that created numerous environmental problems such as threat to natural reserves due to landscape changes, damage to natural drainage, pollution and destruction of natural habitats.

Tin mining was one of the leading mining industry in Malaysia during 19th century and have contributed a lot in the socio-economic development of the country. Malaysia was one of the largest tin producers until the tin crisis of 1985. Malaysia's tin deposits occur in a strip of land about 400 KM long and 60 KM wide between the town of Georgetown and Melaka, along the western coast of Peninsular Malaysia. Most Malaysian tin comes from two states Perak (63%) and Selangor (22%), which together account for about 85 percent of the country's tin mining output (Ashraf, Mohd. & Yussof, 2008).

Many former mine lands face limited conventional development opportunities due to factors such as high remediation cost or a rural location. The reuse of these sites will require creative solutions that involve multiple funding sources and reuse approaches.

As land is getting scarce due to rapid development, previously abandoned ex-mining areas become valuable lands for development. Many urban areas have expanded to ex-mine lands which have numerous ponds. It is estimated that the urban population will double itself every 10 to 15 years (Yong, Chin, Sellapah & Tan, 1985) and mined out ponds in the way of urban expansion will be reclaimed and utilised for the construction of industrial, recreational and residential centres. Many methods have been adopted for reclaiming ex-mining lakes and ponds. The most commonly used method is the developing of housing estates and industrial parks is to lower the water level of the ponds and emplace fill material from one end of the pond (Tan, 1986).

Definition of ex-mining lands

Ex-mining lands or mine scarred-lands are defined as lands, associated waters, and surrounding watersheds where extraction, beneficiation, or processing of ores and minerals has occurred. (US Environmental Protection Agencies, 2004)

In context of town planning, ex-mining lands categorised as brownfields areas means:

"Any lands or premises which are developed or used, but has yet to be fully exploited, although it has a tendency to be used or built buildings. It can also be an empty lot, vacant land or contaminated land. Brownfield sites are not necessarily available for immediate development without any control" (National Urbanisation Policy, 2006).

ISSUES RELATED TO EX-MINING LANDS REDEVELOPMENT

The issues and problems found at mine sites can be varied and significant. Recognizing and fully characterising these problems can be challenging, but necessary. Before investing large amounts of time and money in mine site redevelopment, proper planning should be performed, input and consensus by stakeholders should be encouraged, and the potential environmental liabilities and safety issues of a site should be fully investigated. If the projected land use is mixed development or residential and a large amount of construction is to take place, then more time and money should be spent on planning, market evaluation, and collection of existing site historical information and environmental data. Mined lands have a wide variety of safety, engineering, and environmental problems that can affect activities related to site redevelopment.

a. Safety issues

Safety issues at abandoned mine sites can pose immediate risk to people onsite. Old buildings, draglines, shovels, trucks, and other equipment in dilapidated condition can remain scattered around abandoned mine sites.

b. Engineering issues

Engineering issues at abandoned mine sites can affect existing structures and the approach to construction of new buildings, roads, and other infrastructure for redevelopment. Subsidence of the ground surface occurs when it slowly sinks or collapses into underground mine openings below. Underground mines may have vertical shafts, slopes, drift openings, and mine workings (including haulage ways, water and drainage tunnels), and other passageways excavated from the subsurface that may cause subsidence. Buildings and other structures constructed on land undergoing active subsidence can crack, shift, tilt, and split. Damage to buildings can be so severe that they must be abandoned and demolished.

c. Environmental issues

Environmental issues related to abandoned mine sites are environmental that can cause health risks to humans as well as wildlife and vegetation. Abandoned buildings and structures, such as coal preparation plants, mine hoists, mining equipment, old vehicles, haul trucks, and other hardware related to the mining process, may contain compounds, such as solvents, metals, engine oils, transmission fluid, antifreeze, fuels, grease, and other lubricants, that might have been spilled or intentionally disposed at the site, thereby contaminating soil, ground water, and/or surface waters.

Erosion of mine spoils by stormwater runoff can be a problem. Erosion occurs because the pile of mine spoils is often loose, unconsolidated, steep-sloped, and unvegetated. Transported sediments enter surrounding drainage channels, creeks, streams, and reservoirs, and clogged stream channels can subsequently cause flooding.

Mine spoils and refuse can be poor growth media for plants because they can have a low water-retention capacity, low pH (acidic), high salinity, and high levels of toxic metals, including cadmium, zinc, and manganese. High levels of other contaminants common at mine sites, such as iron, aluminum, and sulfate, may cause additional cosmetic or

aesthetic effects in water by altering its taste, color, or odor. Large numbers of surface mine sites and refuse disposal areas are barren and have lacked vegetation cover for more than a century. They resist practically any form of invasive plant species. To return these mined lands to agricultural fields, forests, or native vegetation, it is often necessary to add significant amounts of agricultural limestone, lime, or alkaline soil amendments to neutralize acidity; fertilizers to restore basic nutrients; and organic matter to help replenish soil and increase its water-holding capacity.

EX-MINING LANDS REDEVELOPMENT POLICIES AND GUIDELINES

a. National Urbanisation Policy (NUP)

The National Urbanization Policy (NUP) outlines various NUP thrusts to coordinate and guide the planning and development of urban areas in Peninsular Malaysia.

Redevelopment policy of ex-mining lands (which are categorised as brownfield areas) outlined in NUP6 which is urban development shall give priority to urban renewal within the urban area.

Implementation measures and strategies;

- i. Implement infill development at potential areas;
- ii. Identify and prepare an inventory of brownfield areas;
- iii. Plan and prepare the re-development programmes for brownfield areas;
- iv. Promote urban regeneration for areas potential for development;
- v. Rehabilitate contaminated lands prior to development;
- vi. Establish an agency responsible for planning and managing urban renewal, and
- vii. Encourage private sector involvement through the provision of incentives and joint venture programmes with the government.

b. Development Plan

According to subsection 2(1), Town and Country Planning Act 1976 (Act 172), development plan refers to the Structure Plan, Local Plan or Special Area Plan for an area that contains the

policies and proposals for economic and social needs of residents through conducive and sustainable physical development.

Structure Plan is written statements that conclude, policies and proposals of the State Authority regarding to the land use and development to achieve sustainable development. Whereas, the Local Plan is a planning document that contains maps and written statement, supported by implementation guidelines. Local Plan serves to translate and detailing the strategic policies of Structure Plan.

Redevelopment policies and strategies of ex-mining lands outlined in the Perak Structure Plan and Ipoh Local Plan will serve as an example as Perak State have the largest coverage area of mines land in Malaysia.

i. Perak Structure Plan 2001-2020

According to Perak Structure Plan, State of Perak has 69,000 hectares (3.26%) of ex-mining area compared to the 2,100,486 hectares of the entire state land area. Recognizing the availability of the ex-mining area in Perak, a number of strategies and measures outlined in the redevelopment of ex-mining lands, such as: -

- Ex-mining lands in Perak (69,000 hectares) are an asset for the State Government (as the government land). However, it is decreasing due to rapid development, which potential ex-mining lands to be developed for commercial property (housing schemes, commercial and industrial).
- Ex-mining lands require specific planning and development approach towards optimizing assets and potential due to rapid development in urban area. Ex-mining land redevelopment plans shall have the objective to achieve sustainable development.
- Potential development of the ex-mining lands in Perak;
 - Commercial property: residential, commercial, office and industrial;
 - Tourism and recreation: theme park, water base recreation activities;

- Agriculture: Aquaculture, livestock and farming, and
- Environmentally conservation: to balancing drainage ecosystem (ex-mining ponds as retention and detention ponds).

ii. Ipoh Local Plan 2020

The development strategies of ex-mining lands outlined in Ipoh Local Plan:

- Heritage tourism development (Heritage Trail), which involves Timah Heritage Trail (2.5km), Kota Lama Heritage Trail (4km) and Kota Timah Heritage Trail (14km) along Jalan Sultan Iskandar (Chinese Miner Association Building, Taman Persisiran Kinta) and Jalan Bandar Timah;
- Implement Water Runoff Management Programme and Integrated Drainage System Management which involved ex-mining areas at Sungai Pinji, Sungai Choh and Sungai Chemor.
- Ex-mining ponds/areas planning control guidelines are;

- To standardise the development of open spaces/mine ponds to be consistent with its function as recreational area and retention pond.
- To improve resident perception of the open spaces and retention ponds function.
- Beautification of ex-mining ponds.
- Enhance an ex-mining ponds safety
- Coordinate the needs of the retention pond design and function with technical agencies such as the Engineering Department, The Department of Irrigation and Drainage and others.
- Prepare a detailed landscape plan of the ponds that can be used as the green and recreational areas and shall comply with the conditions by the local authorities.
- Gazetting of open spaces and ponds (ex-mining ponds) which is controlled

by the state secretary and maintained by local authorities.

c. Planning Guidelines

There are two planning guidelines that affected the redevelopment of ex-mining lands that has been prepared by Department of Town and Country Planning, Peninsular Malaysia which are, Brownfield Areas Redevelopment Planning Guidelines and Environmentally Sensitive Areas Planning Guidelines.

i. Brownfield Areas Redevelopment Planning Guidelines

Brownfield Areas Redevelopment Planning Guidelines will emphasize the development of six categories of brownfield area, such as;

- Category A : Ex-mining area;
- Category B : Closed solid waste disposal sites;
- Category C : Abandoned area of industrial/commercial/residential/institution;
- Category D : Uncompleted development projects;
- Category E : Rows of abandoned buildings lots, and
- Category F : Ex-depot/public transport station, infrastructure and utilities.

Redevelopment of ex-mining lands (Category A, Brownfield Areas) should emphasize the natural aspect of the greenery and development

that has beautiful scenery and water element such as rivers and lakes. Allowable and applicable redevelopment of ex-mining lands, such as;

- Mix development;
- Recreation;
- Golfing resort;
- Residential;
- Heritage, and
- Agriculture and farming.

ii. Environmentally Sensitive Areas Planning Guidelines

This planning guideline is to ensure sustainability of conservation and development of ex-mining lands. Conservation and development of ex-mining areas have to comply with planning principles, namely:

- a. Conservation of ex-mining lands as geological heritage and landscape areas (Heritage Environmentally Sensitive Areas);
- b. To ensure the ex-mining lands have not developed a geo-disaster risk;
- c. Public safety must come first, and
- d. Comply with legal aspects.

Ex-mining lands conservation general planning guidelines such as;

- a. Ex-mining lands should be identified as Environmentally Sensitive Area in Structure Plan and Local Plan.

b. Conservation of ex-mining lands/ponds requires further study include;

- Data collection – area, shape of the ponds, depth and sediment types of the ponds
- Geology study - mining history, soil types, geomorphology of ex-mining area, hydrology
- EIA study

c. Ex-mining ponds can be used as retention pond.

d. Mitigation measures shall be determined if the potential of geo-disaster risk detected.

e. Environmentally Sensitive Area (heritage ex-mining lands) which developed as geology and ecological parks should be provided with 50 meter width buffer zone. Low intensity of development that does not generate air and noise pollution, surface and ground water pollution are allowed.

f. Heritage ex-mining lands that serve as recreational parks are not required to provide buffer zone. Nearby development allowed with condition, which does not cause air and noise pollution, surface and ground water pollution.

Environmentally Sensitive Areas Planning Guidelines outlined detail planning guidelines of ex-mining lands shown on Table 1.

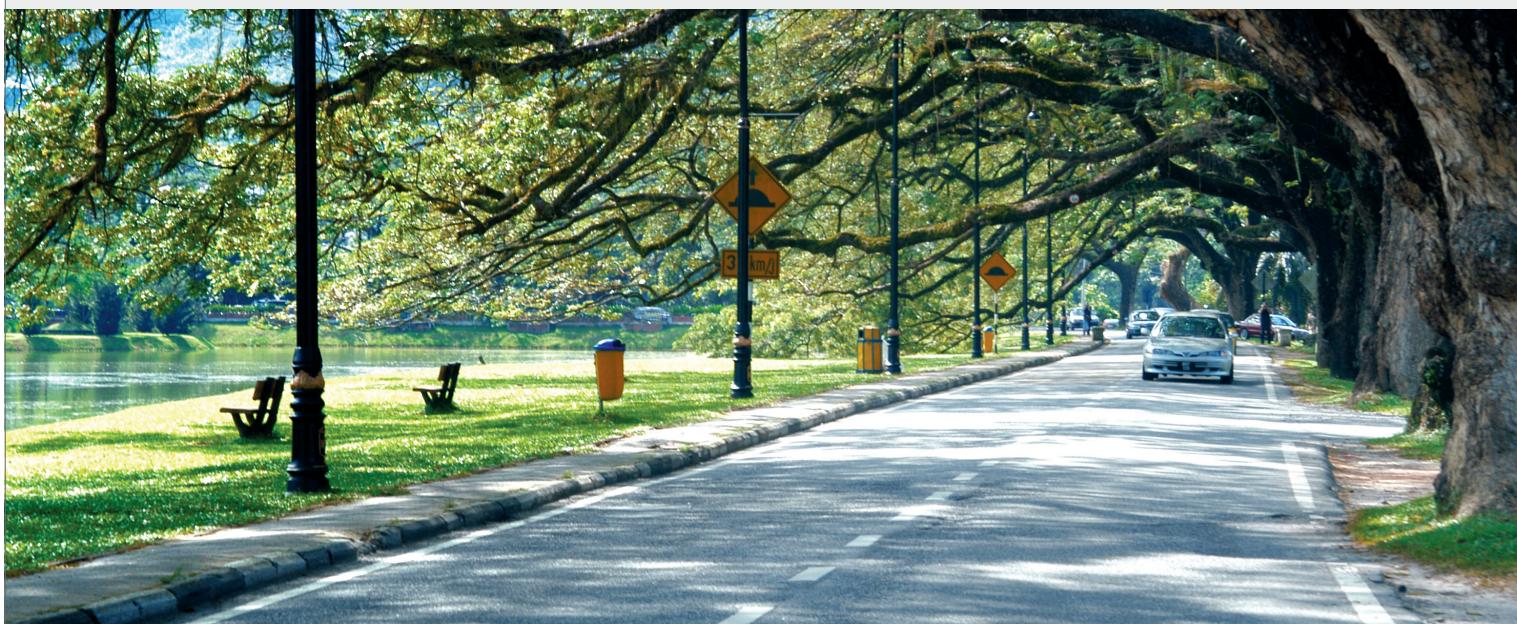


Table 1: Detail planning guidelines of ex-mining lands.

Ex-mining lands types	Sensitivity level	Activity allowed	Activity allowed with condition		Disallowed activity	Note
			Activity	Condition		
Gravel pump, dredger	3	<ul style="list-style-type: none"> • Research • Education • Water catchment • Agriculture and farming. 	<ul style="list-style-type: none"> • Residential • Industrial • Commercial • Recreation 	<ul style="list-style-type: none"> • Site investigation to prevent geo-disaster/hazard • Detail study is required for conservation of ex-mining ponds 	<ul style="list-style-type: none"> • Disposal of solid waste and toxic • Radioactive and toxic chemicals industry based. • All industries that can pollute ground water 	All requirements under the acts and enactments of any prescribed activity shall be complied.
Kolong (tunnel)	2	<ul style="list-style-type: none"> • Research • Education 	<ul style="list-style-type: none"> • Limited residential & Industrial • Recreation • Agriculture and farming 	<ul style="list-style-type: none"> • Site investigation to identify areas suitability and to prevent geo-disaster. • Detail study is required for conservation of ex-mining ponds • Non-toxic or radioactive waste • Non-toxic ponds 	<ul style="list-style-type: none"> • Disposal of solid waste and toxic • Radioactive and toxic chemicals industry based. • All industries that can pollute ground water 	<ul style="list-style-type: none"> • EIA study • All requirements under the acts and enactments of any prescribed activity shall be complied.
Open-cut	2	<ul style="list-style-type: none"> • Research • Education 	<ul style="list-style-type: none"> • Limited residential & Industrial • Recreation • Agriculture and farming • Water catchments 	<ul style="list-style-type: none"> • Site investigation to identify areas suitability and to prevent geo-disaster/hazard • Detail study is required for conservation of ex-mining ponds • Non-toxic or radioactive waste • Non-toxic ponds 	<ul style="list-style-type: none"> • Disposal of solid waste and toxic • Radioactive and toxic chemicals industry based. • All industries that can pollute ground water 	<ul style="list-style-type: none"> • EIA study • All requirements under the acts and enactments of any prescribed activity shall be complied.

Source: Environmental Sensitive Study, 2004

Note:

1 – No development except research activities

2 – Low impacts activities allowed without changes in landuse

3 – Control development (with condition)

SUSTAINABLE REUSE OF EX-MINING LANDS

Ex-mining lands have a variety of potential reuses, including recreation, wildlife habitat, rangeland, historic and scenic preservation, conventional residential, commercial and industrial construction. Generally, the ex-mining lands most frequently reused are the ones that are in good locations, generally flat and non-acidic. For buildings and roads, the crucial issues for reuse involve the overall stability and compaction of underlying materials. If the mine spoils have the potential to slide, undergo differential settlement or fail for other geotechnical reasons, these sites are typically avoided. Sites that are evenly acidic are also generally avoided. However, even these types of sites have been reclaimed and reused if the site conditions allowed and the need for the land was great enough.

Successful examples on the re-use of ex-mining lands in Malaysia, such as;

i. Mix development

- Mine Resort City, Selangor

Mines Resort City was built on the world largest ex tin mining area, covering 1300 acres (including lakes). Mines Resort City applying the concept of mixed development of offices, shopping complexes, hotels, housing and recreation.

On March 30, 1988, the Malaysian government alienated the land to developer for recreational and tourist related developments. To ensure that market-driven components were developed, developer creates a rejuvenation-based master plan, focusing on



Mine Resort City, Selangor



Taiping Lake Gardens, Perak

vegetation and landscaping of the mines. In line with this objective, the first component to be developed was the golf course ensuring that vast tracts of land were rehabilitated to greens. With the vision and the main aim of promoting tourism and becoming a destination in itself, the focus for the overall development was also on MICE (meetings, incentives, convention and exhibition) and an exhibition centre was also developed and completed in 1997.

- Bandar Sunway, Selangor

Bandar Sunway fully-integrated resort township was virtually “resurrected” from a derelict strip of ex-mining land. The rehabilitation and transformation of the landscape has won the township many international awards, including being adjudged the world’s best leisure project by FIABCI (International Real Estate Federation, Paris) in 2002.

The 324-hectare township is truly integrated, having its own hospital, hotels, theme parks, shopping mall, medical centre and two universities - Sunway University College and Monash University Sunway Campus. Once a disused mining pool, Bandar Sunway today is home to some 30,000 residents and its amenities attract more than two million visitors annually. The township’s integrated theme resort, Sunway Lagoon - comprising the twin multi-award winning attractions of Sunway Lagoon Theme Park and Sunway Pyramid shopping mall, and the five-star 1,234-room Sunway Hotel Resort & Spa - is a popular tourist spot. The 32-hectare attraction features five theme parks and boasts of having the world’s largest man-made surf beach spanning 13,000 sq meters, as well as the world’s longest pedestrian suspension bridge.

ii. Recreation

• Taiping Lake Gardens, Perak

The lake gardens were created as the recreational centre for British officers and the increasing number of expatriates in Taiping. It is the oldest public park in Malaysia, has been in use since 1884 and is located within the vicinity of Bukit Larut, magnificently sculptured out of the natural environment.

Since tin mining ceased in Taiping, many of its mines were turned into lakes, namely the South Lake, the West Lake and the Jungle Lake. In between these lakes are small islands and ponds with distinct characteristics, creating a serene and tranquil panoramic landscape. These lakes play a pivotal role in sustaining the city and act as water retention zones that prevent flash floods in Taiping, having one of the world's highest rainfall, averaging over 4000 mm annually (DTCP, 2005). The lake Garden were modeled after the royal parks in Britain (it bears some resemblance to the Kensington Park in London) with its informal picturesque garden characterized by meandering paths, water bodies, expansive manicured lawns and undulating topography.

• Lake Garden, Kuala Lumpur

Kuala Lumpur Lake Gardens (Taman Tasik Perdana) dates to the 1880s and is the city's most popular park. Built around an artificial lake, it encompasses 92 hectares of undulating greenery interspersed with flowering shrubs, shady trees, exceptional botanical gardens, and other notable features. This park was officially opened on May 1, 1975 by the second Prime Minister of Malaysia Tun Haji Abdul Razak Hussein. The attractions that has been developed for public use includes;

- Orchid Garden - has a varieties of 800 species of orchids
- Hibiscus Garden - has many varieties of hibiscus.
- KL Butterfly Park - has more than 6,000 butterflies with over 120 species.
- KL Bird Park - has the world's largest walk-in free flight aviary. It has more than 3,000 birds of various species.
- Boathouse - boating facility.
- Deer Park - has many spotted deer from Holland.

• Paya Indah Wetland, Selangor

Located in Kuala Langat District in the State of Selangor, Paya Indah Wetlands covers an area of 3,100 hectares, encompassing a myriad of ecosystems, namely degraded ex-tin mining land and peat swamp forest. Ever since tin and sand mining was stopped in 1997, Paya Indah begun to recover and is now blossoming into a wonderful site for nature which future generations will inherit. Paya Indah will showcase Malaysia's efforts towards achieving environmentally sound development in tourism,

restoration of degraded areas and conservation of natural resources. Paya Indah has remarkable natural resources and a splendid natural setting. Since its inception (1998) Paya Indah has experienced an approximately 30% increase in its wildlife population. Paya Indah has its own fascinating geography, which consists of peat swamps, and large ex-tin mining lakes. Paya Indah is a education centered whilst undertaking sustainable eco-tourism activities.

iii. Golfing resort

• Clearwater Sanctuary Golf Resort, Perak

Clearwater Sanctuary Golf Resort, is a former tin mine surrounded by seven man-made lakes with beautiful scenery. An area of 739 acres have been redeveloped in 1994 encompasses the golf course with 6,482 square meters and par 72. In addition, the resort has various sports facilities including tennis courts, badminton, gym facilities, driving range, swimming pool, fishing pond and the hotel/ chalet accommodation.



Lake Garden, Kuala Lumpur

iv. Residential

- Lake Fields, Sungai Besi

Former mining ponds turned into part of a lifestyle residential development. Lake Fields, Sungai Besi, is transformed from ex-mining lake into a successful residential enclave. It is a gated development that comprises three-storey terraced houses adjacent to the five-star Palace of the Golden Horses Hotel. There are four main landscaped concepts: linear park, pocket parks, canal greens and water promenade. The Water Promenade will feature a grassy pier and pontoon, terraced seating at the edge of the lake and curved footpaths that seamlessly blend with the green and water edges. The Canal Green featuring panoramic landscaped streets that combine the element of flowing water and lush greenery is designed to encourage

fitness activities like brisk walking and jogging.

• Kampar, Perak

The name Kampar was derived from the Cantonese words *kam pou*, which means 'precious gold'. This refers to the town's previously large tin reserves. Kampar founded in 1887, which was originally a former mine site has been developed into business center, housing, education and services. Various facilities and infrastructure have been constructed for local residents used such as hospitals, schools, water supply, electricity and others.

v. Agriculture and farming

Ex-mining lands reclamation for agricultural purposes is a productive step in helping increase the country's income as well economic land redevelopment. Bidor is a well known agricultural

area for its guava and papaya industry. Most of Bidor agricultural activity is done in an ex-mining area which has been reclaimed for agriculture. Meanwhile, Tambun agricultural area is former tin mining areas that have been developed around since 1990. Pomelo plantation area of 60 hectares in the Tambun area known as eco-tourism zone.

The field of aquaculture, has expanded rapidly at the end is due to the greater attention given by the government in its efforts to increase food production. It grew due to a number which has been intensively prepared by the government, such as subsidies to build a pond (ex-mining pond), pond equipment and fish fry. In 2007, fish farming in ex-mining ponds at Perak totaling to 307 of ponds with 1,394.48 hectares. Fish production from the ex-mining ponds in Perak is 11,504.41 tonnes with a retail value of RM 68,508.08.

Table 2: Retail value, fish production, number and area of ex-mining ponds in operation of aquaculture by State, 2007

State	Numbers	Area (Ha)	Fish production (tonnes)	Retail value of fish production (RM'000)
Perlis	0	0.00	0.00	0.00
Kedah	0	0.00	0.00	0.00
Penang	0	0.00	0.00	0.00
Perak	307	1,394.48	11,504.41	68,508,08
Selangor	77	218.39	526.28	3,114,49
N. Sembilan	0	0.00	0.00	0.00
Melaka	0	0.00	0.00	0.00
Johor	0	0.00	0.00	0.00
Pahang	7	29.50	8.75	39,73
Terengganu	0	0.00	0.00	0.00
Kelantan	0	0.00	0.00	0.00
Sarawak	0	0.00	0.00	0.00
Sabah	0	0.00	0.00	0.00
Total	391	1,642.37	12,039.44	71,662,30

Source: Department Of Fisheries Malaysia, 2007

vi. Retention Ponds (Integrated Storm Water Management)

Rehabilitation of ex-mining ponds for retention ponds or integrated storm water management is to solve the urban storm water problem such as flash flood and pollution. Malaysia has many abundant ex-mining ponds which can be fully utilized for integrated storm water management (Chang, 2008). It takes into account of the quantity and quality of runoff, as well as the amenity value of surrounding area in the urban environment. For example, rehabilitation of ex-mining ponds project at Kinta District, Ipoh, covers an area of 88 acres and generally divided into several categories which include open spaces, ponds, earth drains and also wetland or swampy area.

CONCLUSION

Active tin mining in Malaysia took place in the late nineteenth century, immediately after the British colonization of the Malay Peninsula had begun. As result of about 100 years of mining, the country is now left with over 113,700 ha ex-mining lands. As land is getting scarce due to rapid development, previously abandoned ex-mining areas become valuable lands for development. To days, numerous of ex-mining lands have been developed including housing, recreation, golf resorts, agriculture and farming due to rapid development especially in urban areas. In developing the ex-mining lands, it is the responsibility of all parties at local, national and regional levels to ensure that the development towards achieving sustainable development agenda. Accordingly, compliance with legal requirements, policies and guidelines of ex-mining redevelopment is essential.

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TOWARDS GREEN TRANSPORTATION

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ABSTRACT

The environment is compromised by the increased demand for mobility and accessibility. Given that transport and traffic growth is at the core of environmental problems and pertinent issues in sustainability, this paper recaps the background of sustainable transport and sustainable transport movement worldwide, updates initiatives in sustainable transportation and revisits the relationship between transport and land use planning. In the context of change in climate, adaptation measures such as supporting the use of green vehicles are highlighted. This paper also summarizes specific areas of improvement towards sustainable transport.

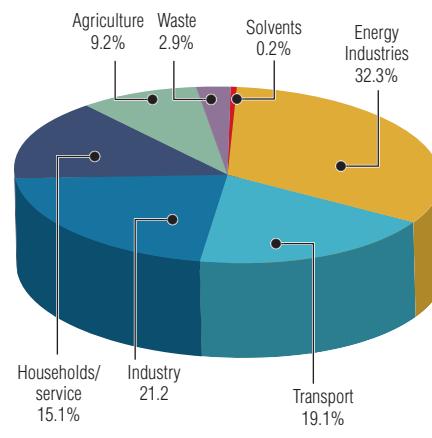
Keywords: sustainable transport, public transport, land use planning, smart growth, transit-oriented development (TOD), and minimizing emissions.



INTRODUCTION

Though transportation is an essential feature of every function of society, the transport sector remains largely responsible for the deterioration of the urban environment, being responsible for most pollutant and greenhouse gas (GHG) emissions. Diagram 1 demonstrates the European Union (EU) GHG gas emissions. Emissions in the transport sector are increasing at a faster rate than any other energy using sector and this reflects the worldwide situation. There are approximately 700 million vehicles on the road today. China has 70 million and is expected to grow to 200 million in 2020. Kuala Lumpur alone has approximately 3 million vehicles to date and over 65% traveling the primary roads are single occupancy vehicles (SUV's)¹

Diagram 1: EU greenhouse gas emissions in 2005².



The already massive contribution of traffic to the environmental problem is likely to become even more critical in future, in view of the threat of continuous growth in the demand for motorized transport. The opinions of 'traffic-focus' advocates in building more roads seen by them as the basic and constructive solutions to the urban congestion problem have proved to be unsustainable. Simply, road building and thus more motorized traffic, is an expensive way (environmentally, economically and socially) to deal with travel demand.

SUSTAINABLE AND GREEN TRANSPORT MOVEMENTS

Conscious strategies towards sustainable transport which emerged in the 1970's were supported by Sustainable and Green Transport Movements. For example *Transport 2000* was formed in 1972 by environmental pressure groups; elsewhere agencies promoting the European Sustainable Transport Strategies had similarly played an important role in promoting sustainable transport. In 1994, a small international working group at the Organization for Economic Cooperation and Development (OECD) had defined and charted the path towards Environmentally Sustainable Transport (EST). Under the Asian EST Initiative which is a joint initiative of UNCRD³ and the Ministry of the Environment,

¹ Estimations from National Key Result Area (NKRA) Urban Transport Lab 2009, Malaysia

² Current emissions in the transport sector have surpassed 20%

Japan, the Regional EST Forum provides a strategic and knowledge platform for sharing experiences and disseminating among Asian countries best practices, policy instruments, tools, and technologies in relation to various aspects of EST. Participating countries totals twenty-two Asian countries, including Malaysia.

Elsewhere, cities began including sustainability as a key consideration in transport and land use planning. Public transport leaders such as Curitiba in 1974 and Bogota in 2000 had been promoting public transport through their Bus Rapid Transit System (BRT). Many other cities throughout the world have similarly recognised the need to link sustainability and transport policies. Currently, the EU Directorate-General for Transport and Energy (DG-TREN) also serves as a platform suggesting directions for sustainable transport.

In Malaysia, the buzz on Sustainable Transport started in the late 90's with an initiative by the Federal Town and Country Planning Department in producing a Guideline on Sustainable Transport. Public transport was also promoted in the National Physical Plan 2005 and its revision in 2010 with 'Compact cities to be Urban Development Priorities'.⁴

Similarly in the Malaysian Government's Transformation Programme, public transport was identified as a National Key Result Area (NKRA). On social network, TRANSIT, The Malaysia Public Transport Forum also discusses sustainable transport.

EXISTING TRENDS

Existing trends of rapidly increasing car use and ownership, declining mode of share in public transport, rapid decentralization into car-oriented suburban sprawl and lack of initiatives to promote walking and cycling have contributed to CO2 emissions (kg per capita per year). Table 1 shows a general outlook on the percentage of usage of public transport (including walking and cycling) in selected countries and the corresponding CO2 emissions per year⁵.

Table 1: General relationship between CO2 emissions and the usage of sustainable transport modes.

	% public transport, walking, cycling	CO2 Emissions (kg per per capita per year)
Houston	5	5690
Malaysia*	12	na
Montreal	26	1930
Madrid	39	1050
London	50	1050
Paris	54	950
Berlin	61	774
Tokyo	68	818
Hong Kong	89	378

Source: Adapted from GTZ Sourcebook Module 'Transport and Climate Change' 2007

The profile generally shows an inverse relationship between CO2 emissions and the usage of sustainable transport modes (public transport, walking and cycling).

DEFINITIONS

The term Sustainable transport, also commonly referred to as Sustainable Transportation or Sustainable Mobility, has no formal definition, but is a logical follow-on from the earlier term Sustainable Development whose origins were in the 1987 *Our Common Future*⁶. Subsequently, sustainable development principles proposed by the OECD Congress in 1996 include *Access, Equity, Individual and Community Responsibility, Health and Safety, Education and Public Participation, Integrated Planning, Land and Resources Use, Pollution Prevention and Economic well being*:

Based on these principles, a sustainable transportation system can also be one that:

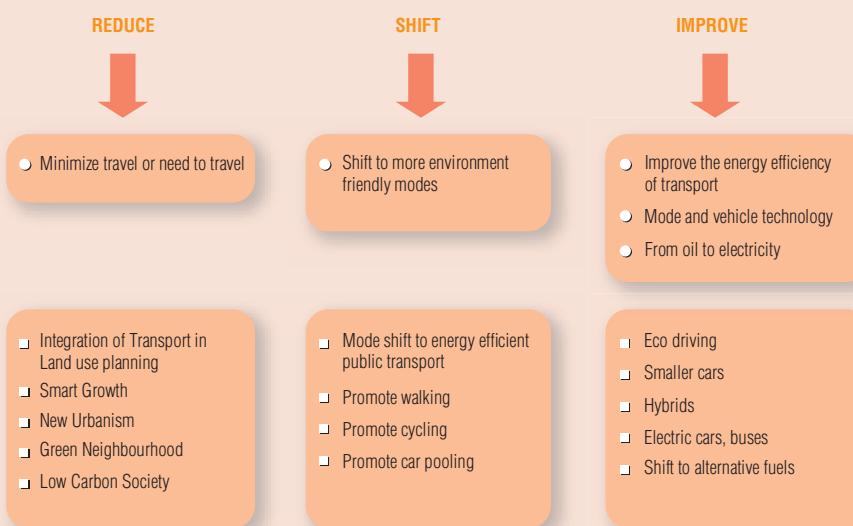
- i. Allows the basic access needs of individuals and society to be met safely; and in a manner consistent with human and ecosystem health, and with equity within and between generations.
- ii. Is affordable, operates efficiently, offers choice of transport mode, and supports a vibrant economy.
- iii. Limits emissions and waste within the planet's ability to absorb them,

³ The United Nations Centre for Regional Development, was formed in 1971

⁴ as quoted in National Physical Plan Policy No. 16

⁵ The main contributors are the industry sectors

⁶ 1987 World Commission on Environment and Development of the United Nations

Table 2: Reduce, Shift and Improve.

minimizes consumption of non-renewable resources, reuses and recycles its components, minimizes the use of land, minimizes noise and visual intrusion.

In sum, Sustainable transport refers to any means of transport with low impact on the environment, one that minimizes fuel consumption and emissions of carbon dioxide and pollutants. Sustainable transport is more about accessibility and mobility, than about 'transportation', and about finding ways to move people, goods and information in ways that reduce its impact on the environment, the economy, and society. To recap, some options include:

- Minimizing travel
- Improving transport choice by increasing the quality of public transport, cycling and walking facilities, services and environments and promote healthy lifestyles.
- Using cleaner fuels and technologies
- Using renewable energy
- Adjusting technologies to make vehicles green (electric cars, hybrids, including those using wind and solar)
- Using telecommunications to reduce or replace physical travel, such as tele-working, tele-conferencing and tele-shopping.
- Planning the layout of our cities to bring people and their needs closer together, and to make cities more vibrant and walkable

- Landuse change that promotes public transport, transit-oriented development, smart growth and new urbanism.

LANDUSE PLANNING AND GREEN TRANSPORT INITIATIVES

Public Transport

The core of sustainable transportation is the use of public transport. The justification for public transport in the context of reduction of emission is well documented. Table 2 summarizes the case for sustainable transport, public transport being instrumental in the equation, with the case of first reducing travel and the reasons for travel, then shifting to more environmental friendly or green modes and the improvement on energy use and eco-vehicles.

Closer to home, the Government Transformation Programme had included the improvement of urban public transport by increasing the modal share to 13% by 2010 and to 25% by 2012 during the morning peak period by providing integrated and seamless "network" of public transport services with improved reliability and journey times, comfort and convenience. Amongst initiatives are the introduction of Bus Expressway Transit (BET), Bus Rapid Transit (BRT), enhancing Park and Ride, construction of Integrated Transport Terminals (ITTs) and in the longer term, congestion charging. In addition the Klang Valley Mass Rapid Transit system had also been proposed and expected to complete in 2019

Mixed development

The life of urban residents revolves multiple trip-making, to home and work, shopping, recreation and entertainment, social visits and trips to school. Trip making are governed by land use distribution which in the past have been disparate and exclusive i.e. largely for single uses thus trips made are generally for one purpose. As such, mixed development which may reduce trip-making, and creative urban design which improves conditions for non-motorized transport and walking would support good connectivity thus sustainable transport objectives. Mixed used development is also a feature of smart growth.

Smart Growth, New Urbanism and Transit Oriented Development (TOD),

Landuse rationalization can be used to reduce transport demand. In regulating landuse approaches, 'smart growth', 'new urbanism' and transit-oriented development supporting the public transport system, have been well documented. Among key words are: connectivity; walkable neighbourhoods; mixed land uses; attractive communities with a strong sense of place; open space and environmental amenities; strong communities, compact building design; range of housing choices; transportation choices and collaboration. These of course require changes in lifestyles, supporting green modes such as walking and cycling, with less dependency on the conventional motorized vehicle.

The compactness of a development also supports transit. Echoing the policies to support transit-oriented development in the Malaysian National Physical Plan and the National Urbanization Policy, the Kuala Lumpur Structure Plan had committed TOD's as one of its policies for public transport whereby one of its policies prescribes the establishment of a transit planning zone to facilitate intensification of transit oriented development around rail stations.

GREEN VEHICLES AND TECHNOLOGY

Green technology is the development and application of products, equipment, and systems to conserve the natural environment and resources, which minimises and reduces the negative impact of human activities. It is also a system which minimises the degradation of the environment, has a zero or low GHG emission, safe for use and promotes healthy and improved environment for all forms of life, conserves the use of energy and natural resources, and promotes the use of renewable resources.

In adaptation to the changing climate, **sustainable technologies** are required to improve the energy efficiency of automobiles. An Eco Vehicle consists of task-oriented **electric vehicles (EVs)** and **hybrid vehicles** (which can be retrofitted) that have minimal impact on the environment. The challenge however is consumer acceptance (because they need same travelling range, comfort and safety) and usually standard electronics face challenges to survive. New prototypes usually need a lot of testing in labs and fields, reliability issue may be a show stopper. Currently the main players in hybrid and EV's are the Japanese, the Japanese have a strong position as the development of bio-fuels puts them in a better position in developing and using green transport. The development of Hybrids and EVs needs to be integrated where telecommunication companies become the major backbone. Amongst criteria influencing adoption of green technology is availability, cost of implementation, ease of implementation, sustainability and potential for standardization.

From a local perspective, Proton, in 2004 has conducted the Hybrid feasibility study and recently in 2010, had exhibited a prototype named EMAS (Eco Mobility Advance Solution). A comparison of gross estimates of total running cost and loan repayment claimed no marked increase.

Still closer to home, the promotion of green vehicles is evident Malaysia's 2010 budget with full import duty and 50 per cent excise duty exemption granted to franchise holders of hybrid cars as well as hybrid electric motorcycles. To further encourage

ownership of hybrid cars, import duty and Excise duty will be exempted.

A higher occupancy vehicle, the concept of a Superbus had also been promoted. Superbus is an electrically powered vehicle which uses rechargeable batteries, has low energy consumption, with a high level of comfort. It is 15 meters long and provides seating for 23 passengers. In order to improve comfort and to allow individuality, it has 8 doors per side drives 250 km/h on a special track and also drives on highways and secondary roads. Since it runs on standard roads, it can fit seamlessly into the existing infrastructure including on relatively cheap concrete roads.

GLIMPSE OF THE NEAR FUTURE

Since the early 90's there were many scenarios probing the relationship between mobility and the society. Imagineers then gave a scenario of cities being "super-high-tech" using advanced telematics; cities rendered with extensive underground rail infrastructure or suffer the assignment a mobility quota. On a more pragmatic approach, Tranvisions 2009⁷ had projected some of the following scenario:

Technology:

Vehicle technologies, reducing CO2 emission limits for new vehicles and introducing non-fossil fuelled vehicles. Robot Driven cars by 2030. Use of Personal Rapid Transit (PRT)⁸ as introduced in Masdar City. Vehicles can be communal, no private ownership, no fixed guides and can go anywhere underground.

Regulatory:

Reduction of vehicle speed limits on roads and highways and increase in rail urban transport

Economic:

Use of price mechanisms to increase occupancy rates and load factors

Infrastructure:

Very selective road investments

Lifestyle:

Tele-working reduces the need to travel. It is estimated that by 2050, most people will be part time tele-workers thus the reduction of working trips.

⁷ Compiled by the EU Directorate-General for Transport and Energy (DG-TREN), 2009

⁸ Usually for 6 people

SUMMARY

As a summary, the following table (Table 3) highlights key areas of improvement towards sustainable transports that have been discussed above:

Table 3: Summary of areas of improvement towards sustainable transport

Areas of Improvement	Features
Clean fuels and vehicles	Biodiesel, Biogas/CNG, Fuelling Station, Hybrid Vehicles, Electric Vehicles, LPG, Procurement & tendering
Access restrictions	Access management / Enforcement, Car Restricted Zones /Living Streets, Mixed Development, Parking Management, Pedestrian Areas, Traffic calming / Speed reduction
Integrated pricing strategies	City road pricing, Integrated ticketing, Parking Management, Smart card
Public Transport/Collective passenger transport	Accessibility, Flexible mobility services, Intermodality, Network development, Park & Ride, Universal Design, Quality Corridors / alignments, comfort and reliability.
Less car intensive lifestyle	Reducing private car use, Car pooling, Car sharing, Car/ driver licence exit strategies, Cycling, Bike sharing, Walking, School children mobility management, community participation
Transport management	Access management / Enforcement, Guidance Systems

Adapted from The EU Directorate-General for Transport and Energy (DG-TREN), 2006



CONCLUSION

Sustainable transport initiatives have taken form over two decades ago even before official debates on GHG emissions and climate change adaptation began. The quest for more sustainable transportation also reinforces the inter-relationship between transport and land use planning whereby good landuse planning concepts and design can affect travel choice, potentially minimizing the need to travel by rationalizing landuse distribution. But what is also clear is that sustainable transportation refers not just to technology, but most importantly, human behavior. The choices of making travelling less, the choice to walk, to cycle or take the car pool and other sustainable transport buy-ins are very much behavioral. There is also the issue of community acceptance. For instance, scientists and engineers may develop a feasible electric car that has minimal emissions but neither car makers nor policy makers will accept it unless the economics and the market conditions assure a benefit to them. Even then, non-polluting cars alone will not relieve congestion if behaviours on trip making and car occupancy do not change. Thus support from local communities is instrumental. Lastly, capacity, commitment and creativity is required of Local Authorities to manage funds and trade-offs, promote community awareness and foster future land use planning directions in tandem with sustainable transport.

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LOW CARBON SOCIETY INITIATIVES IN MALAYSIA

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ABSTRACT

This paper outlines some initiatives on Low Carbon City (LCC) in Malaysia in creating the Malaysian Low Carbon Society (LCS). The planning for LCC is vital in shaping LCS that adopts patterns of consumption and behaviour that are consistent with low levels of greenhouse gases (GHG) emissions. This paper first gives an overview of the concept of LCC and LCS and some initiatives on LCS in Japan and the UK. The paper then outlines LCS initiatives in Malaysia with a particular reference to Iskandar Malaysia in Johore.

INTRODUCTION

Human activities are said to be the main contributor to the emission of greenhouse gases (GHG) into the atmosphere. Therefore, humanity has been pointed out as responsible for a warming influence on climate (IPCC, 2007). According to the Stern Review on the Economics of Climate Change (Stern, 2007), mitigation measures should lead to less costs than the damages caused by the effects of climate change in a business as usual (BAU) scenario. Thus, mitigation measures should be one of the major ingredients of planning a city. In city planning, Low Carbon City (LCC) is leading the way in incorporating mitigation measures towards tackling the global climate change issues for sustainable development, particularly in consumption of high level of low carbon energy sources by making use of alternative renewable energy and high level of energy efficiency. The Kyoto Protocol defined commitments for 2010 on the reduction of greenhouse gases (GHG) emitted by most industrialised countries. Several developed countries are facing difficulties to meet this objective. For example, despite the target made by the European Union countries to reduce their emissions by 8%, five years before 2010 (the commitment period) the overall reductions were only around 2% (Eurostat, 2008). Despite climate change being a global threat, local and individual actions are essential to mitigate it.

WHAT ARE LOW CARBON CITIES AND LOW CARBON SOCIETIES?

From research findings, Low Carbon City (LCC) is a city that comprises of societies that consume sustainable green technology and relatively low carbon energy as compared with present day practice to avoid adverse climate change. LCCs are cities that take actions which are compatible with the principles of sustainable development, ensuring that the development needs of all groups within the society are met. They are cities that make an equitable contribution towards the global effort to stabilise the atmospheric concentration of CO₂ and other greenhouse gases at a level that will avoid dangerous climate change, through deep cuts in global emissions. LCCs demonstrate a high

level of energy efficiency and use low-carbon energy sources and production technologies. Their communities which are called Low Carbon Society (LCS) adopt patterns of consumption and behaviour that are consistent with low levels of greenhouse gas emissions. LCS embraces a lifestyle that makes more use of alternative renewable energy, less dependence on fossil fuel and practices 3Rs (reduce, reuse and recycle) in their everyday life.

LCS INITIATIVES

Low Carbon Society (LCS) was introduced in Japan in 2004. Japan's initiative towards LCS includes a published report on "Building a Low Carbon Society" by the Central Environment Council to 12 sessions of committees, as well as incorporation of public consultation results. The report is the first to achieve "Cool Earth 50" and it developed principles as follows:

1. Realisation of carbon minimum;
2. Creation of simple life in which people actually feel richness; and
3. Establishment of symbiosis with nature which is green technology.

In 2007, Japan released a report on Feasibility Study for 70% CO₂ emission reduction by 2050 below the 1990 level through technologies potential. The project estimated that 70% of CO₂ emission reduction is necessary to contribute towards stabilising the global atmospheric condition and examined wide range of actions to be taken and the impact of each action by a computer model. Japan Scenarios and Actions towards Low-Carbon Societies (LCSs), June 2008 listed the following initiatives:

1. Comfortable and Green Built Environment/Green Technology;
2. Anytime, Anywhere Appropriate Appliances;
3. Promoting Seasonal Local Food;
4. Sustainable Building Materials;
5. Environmentally Enlightened Business and Industry;
6. Swift and Smooth Logistics;
7. Pedestrian Friendly City Design;
8. Low-Carbon Electricity;
9. Local Renewable Resources for Local Demand;
10. Next Generation Fuels;
11. Labeling to Encourage Smart and Rational Choices; and
12. Low Carbon Society Leadership.

Following that, Japan announced in March 2010 its mid and long term road maps for global warming measures that encompass the followings:

- Daily Life – 100% achievement rate of a higher Energy Efficiency Standard for all newly built homes and buildings in 2020, 100% achievement rate of Zero Emission Homes and Buildings for all newly built homes and buildings in 2030; and 2.5 million sales of Next-generation Vehicles in 2020;
- Community Development – 10% reduction of per passenger automobile use;
- Manufacturing – Reduce energy usage by 30-40% by 2050;
- Energy Supply – 10% of primary energy supply to be renewable energy sources by 2020; and
- Core Social Systems for Creating a Low Carbon Society – A Cap and Trade domestic mission trading scheme and Global Warming Tax.



The UK government on the other hand, has committed to a 60% cut in carbon emissions by 2050 as compared to Japan that has a more ambitious target. Within the UK, Bristol, Leeds and Manchester are three core cities pioneering the city-wide carbon reduction strategy process (LCC process). The UK government outlines LCC as a well designed, sustainable city which will provide a better quality of life for all of its community, being a healthier, less polluted and quieter place to live and work in. The profile of such city includes the followings:

- **Less private car use** – Cities need to be organised so that people can travel less in their daily lives, and so that walking, cycling and public transport are all easier. New development should have a mix of uses and be well served by public transport.

The Low Carbon Cities Newsletter, 2009 reported that the clear city-wide carbon reduction strategy process (LCC process is used within each of the three core cities), which includes developing shared goals between the key public sector components of that city, agreeing governance arrangements and ownership, carrying out a carbon footprint for the city, identifying key carbon saving options, developing a tailored and appropriately resourced action plan and implementing the plan. The programme is to assist the Government in meeting its commitment to engage with core cities and to develop valuable lessons and tools to be disseminated to all cities and local authorities.

Additionally, other local authorities are selected to work with the UK Government to develop an ambitious programme of action to tackle climate change by testing new local carbon frameworks. Oxford, Northumberland, Haringey, Nottingham, Plymouth and Bournemouth Poole and Dorset MAA councils besides Manchester, Leeds and Bristol are taking the centre stage in the UK's action to tackle climate change whilst residents in those areas will reap the benefits of large scale home insulation projects, alternative sources of energy and the emergence of greener communities which together could reduce fuel bills alongside other wider benefits. The

- **Greener streets** – streets can be vents to help counteract the 'urban heat island' effect in the summer. Large tree canopies are needed to shade and cool streets and buildings in summer – deciduous trees, so they let the light through in winter.
- **A fairer place to live** – with fuel prices soaring, people on low incomes are most affected by poorly insulated homes, which are expensive to heat and car dependency increases because of lack of affordable public transport.
- **Public space** – greenery cools the air down through evaporation (provided you do not let green turn brown - winter rainfall needs to be managed and stored). Having high quality open spaces nearby matter most to people without gardens, or who cannot afford holidays or country cottages.
- **More prosperity in the future** – creating markets and opportunities for low carbon businesses and new green technologies, by designing in space and facilities, makes the city more competitive and future-proofed. Good city design makes the most of existing assets and resources.
- **Better use of existing resources** – this includes waste, water and energy, as well as public transport and strengthening local networks and services. This can save money so makes economic sense as well.
- **Inclusive, with a strong identity** – a place which takes accessibility seriously and which everyone can enjoy using equally, and which embraces new cultures; a place which builds on its spirit and character, and reflects that in its buildings and spaces and their uses.

Figure 1: LCC 5-Step Process for 3 Core Cities



LCCP 5 Step Process for 3 Core Cities



frameworks will promote new and more effective ways of meeting Governments ambitions on the essential climate change agenda. The eventual aim is to give incentives to all councils to significantly reduce their carbon emissions. This is done by working more closely with energy suppliers to develop ambitious plans for 'greening' up domestic and non-domestic properties, increasing the demand for renewable energy, considering how to increase the economic viability of new energy sources, boosting links to heat and energy schemes and make more effective use of surplus energy to power homes which would all potentially unlock new sources of income for local authorities.

In a nutshell, the local carbon frameworks in the UK involve councils to:

- set out a clear set of targets for action and a route for progress and milestones. Many of the councils involved have already set themselves stretching targets

to reduce carbon emissions - 40 per cent reductions by 2020. The frameworks will support ambitions for going even further, faster;

- develop a clear strategy for how carbon reductions can be achieved. Robust and strongly evidence based; this strategy will need to articulate how the council will secure community buy in and involvement; and
- produce a delivery plan involving all its partners, including those outside the formal strategic partnership.

Whilst Japan and the UK can be a good lesson for other countries including Malaysia to emulate, the framework and activities outlined should be thoroughly studied for efficient adoption and implementation. Through planning, plans may set out action that is needed on issues spanning recycling, energy efficiency, wind power, transport and others. State and Local authorities are expected to put together a prospectus setting out how they would develop and deliver a local carbon framework. The

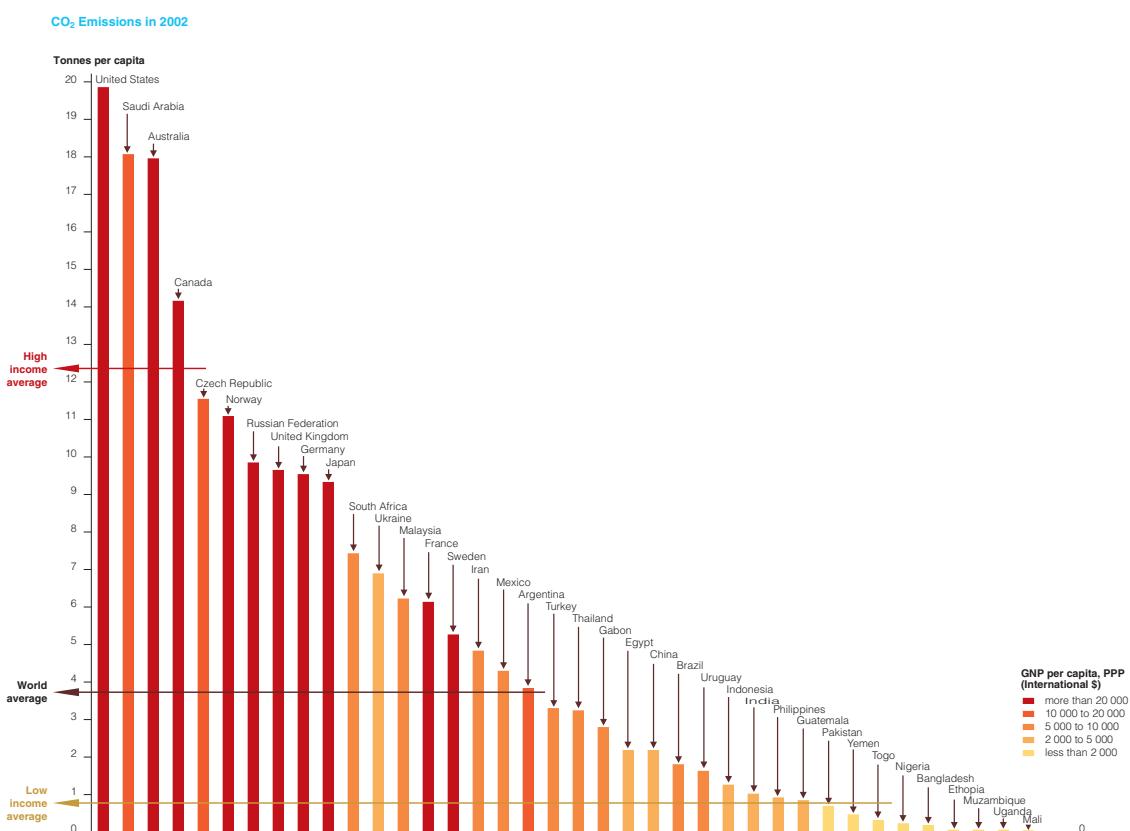
prospectus will then be negotiated and agreed with the Government. It will then be down to the local authorities to take forward delivery and report on its achievements.

PLANNING FOR LOW CARBON CITIES AND SOCIETIES IN MALAYSIA

Malaysia is a newly developing nation and one of the 172 countries that has signed the Kyoto Protocol at the United Nations Framework Convention on Climate Change on 12 March 1999 and further ratified on 4th September 2002, aimed at combating global warming. However, ratification does not imply a country has agreed to cap their emissions and Malaysia (at that time) was not within the 35 countries that have agreed to cap their emissions.

Nevertheless, the Malaysian government has been continuously promoting the environmental agenda in all development plans. Since the Eighth Malaysia Plan (2001-2005), the incorporation of environmental

Figure 2: Comparison of Malaysia and other countries in terms of CO₂ emission per capita in 2002



Source: United Nations Environment Programme/GRID – Arendal, 2007

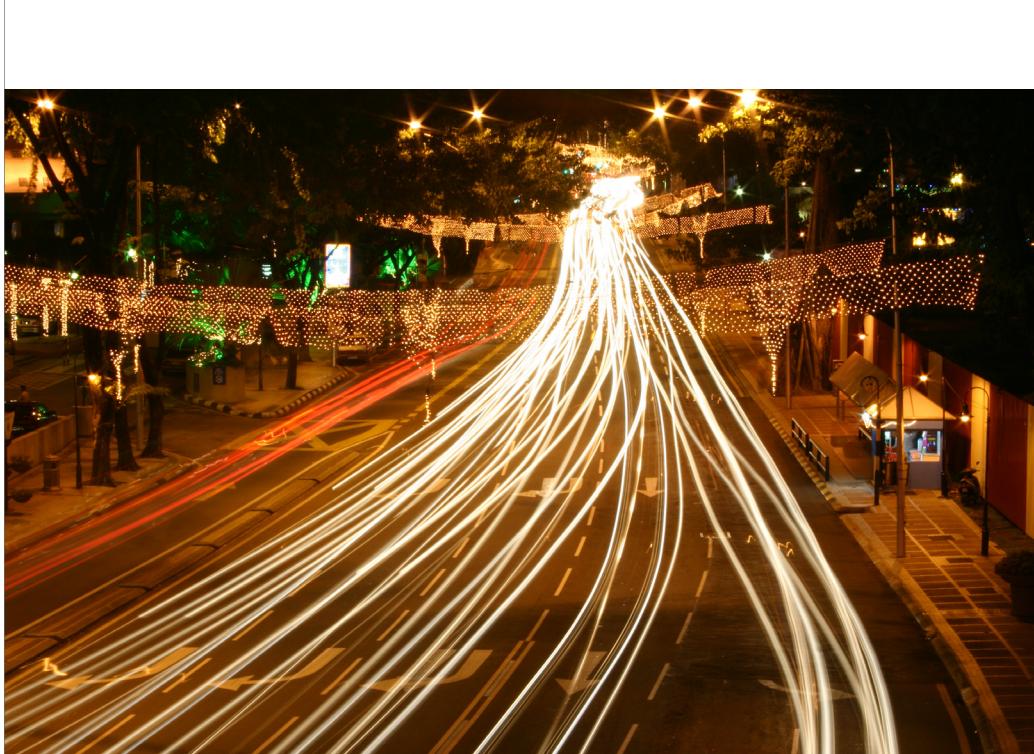
consideration into planning and development was intensified (EPU, 2001). Due to the continuous efforts to promote sustainable development, Malaysia is being ranked number 38 among 146 countries worldwide, which is second in Asia (after Japan), with the Environmental Sustainability Index (ESI) of 54 with regards to environmental sustainability (Yale University, 2005) (Figure 1). Malaysia puts emphasis on improving environmental quality through better management in major areas of concern particularly air, water quality and solid waste management as well as the utilisation of cleaner technologies (EPU, 2006).

The Honourable Prime Minister announced in Copenhagen during COP 15 that Malaysia is adopting a voluntary national reduction of up to 40% in terms of GDP emission intensity by 2020 compared with the 2005 levels. The figure 40% reduction is up to 40% carbon intensity of GDP which is carbon intensity reduction includes carbon equivalent i.e. carbon emitted divided by GDP. This contribution is important (to measure the country's progress in climate action) and to receiving funds and transfer of technology from Annex 1 countries. The Ministry of Natural Resources and Environment (NRE) is currently laying out the road map for Malaysia to achieve the national target reduction of GHG emission by 2020.

The particular challenge for the implementation of climate change policy is to minimise growth of energy consumption while enhancing economic development. To do this, the Government has established the Ministry of Energy, Green Technology and Water (KeTTHA) in April, 2009 to facilitate the growth of Green Technology industry and enhance its contribution to the national economy.

LOW CARBON CITIES AS SUSTAINABLE CITIES IN MALAYSIA

In Malaysia, CO₂ concentration increases mainly due to rapid urbanisation and industrialisation, relatively high dependence on fossil fuel use, high private car ownership and land use change (Ho, Gomi and Simson; 2010). Planning for LCS involves promoting low carbon emission, particularly CO₂ through land



use urban planning and development control by implementing the concept of LCC. Land use planning can help to integrate sustainable development concept by promoting mixed land use and public transportation and compact cities development. The use of zoning system as in structure and local plans allows appropriate and compatible mixed use development by combining commercial with residential or office use in the same building or on the same site can help to reduce in between space movement. Hence, it can also reduce transportation energy and CO₂ emissions.

Malaysia LCS study was initiated by the study team of Low Carbon City 2025: Sustainable Iskandar Malaysia involving Iskandar Malaysia, Universiti Teknologi Malaysia and Kyoto University in January 2009. The study suggested a working definition of LCS that should have the following attributes:

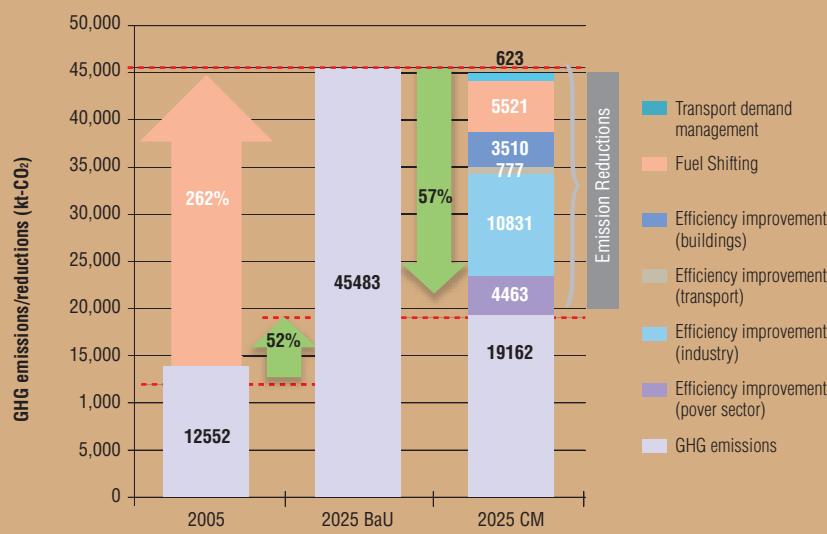
- a) Take actions that are compatible with the principles of sustainable development, ensuring that the development needs of all groups within the society are met.
- b) Make an equitable contribution towards the global effort to stabilise the atmospheric concentration of CO₂ and other GHG at a level that will avoid dangerous climate change through deep cuts in global emissions.
- c) Demonstrate a high level of energy efficiency and use low carbon

energy sources and production technologies.

- d) Adopt patterns of consumption and behavior that are consistent with low levels of GHG.

Urban land use planning policies i.e. at building scale to city scale will have important implication for energy demand and supply which will in turn affect environmental sustainability. Consequently, urban planning through land use planning and planning control plays a vital role in implementing the green technology in low carbon cities programme, particularly during the formulation of development plans from the highest level, i.e. National Physical Plan and then translated to the lower levels that include structure plans and local plans. The key partners integral to the success of the LCC programme are public sectors particularly local government and institutions with major influences of the housing associations and developers, large businesses and communities. For instance, the local authorities can impose conditions of the usage of green building materials and sustainable neighbourhood design during the planning and building submissions. Other areas that local authorities can initiate are:

- **Agricultural Waste** – Organic wastes which are produced as a result of agricultural activities can be converted to energy through various technologies.
- **Building Products and Materials** – Energy used in buildings consumes

Figure 3: GHG Emissions Target for IM 2025

approximately 30% of the world's energy resources. Products that reduce this consumption can reduce the emission of greenhouse gases into the atmosphere.

- **Energy Distribution** – Products which reduce energy distribution losses such as insulation, leak detection and repair and overall improved maintenance.
- **Forestry & Energy Crops** – Wood can be used as a fuel. Certain crops can also be grown for energy uses.
- **Industrial Waste** – Organic wastes are produced through an array of industrial activities which can then be converted into energy through certain technologies.
- **Lighting** – Lighting is one of the largest influences on the emission of greenhouse gases. Technologies exist which reduce these emissions.
- **Solar Energy** – Energy from sunlight can be converted into heat through various devices for use in residential, commercial and industrial buildings.
- **Solar Power** – Materials which when subjected to sunlight can generate electricity.
- **Waste** – Waste can be converted into energy through its organic matter through certain technologies.
- **Rain Water Harvesting** – rain water collection and distribution for housing, commercial and industrial use.

The Low Carbon City (LCC) 2025 study aims to show the possibility of developing Iskandar Malaysia (IM), Johor into a LCC in Malaysia. The methods involved are as follows:

1. Developing the current inventory of GHG emissions of IM; and
2. Quantifying the social economic activity level in 2025 (see Figure 1) according to IM Comprehensive Development Plans 2025.

LCC development policies for IM (Ho, Gomi and Simson; 2010) outlines the following:

- a. Energy efficient buildings and sustainable neighbourhood design
 - Green building rating
 - Creating healthier and more resource-efficient models of construction, renovation, operation, maintenance and demolition
 - Green Neighbourhood with self-contained facilities (with reduced use of private vehicles)
- b. Sustainable land use and transportation
 - Mixed land use, public transport, compact city development
 - Transit Planning Zones within 400m radius of rail stations
- c. Natural and green environment
 - 150,000 ha. of natural and green environment

Briefly, the findings for Iskandar Malaysia (IM) show that the GHG emissions of IM will increase 3.6 times higher than of the level at 2005 without mitigation measures, and by adopting the mitigation options available (mitigation measures and policies that comprise the residential and commercial sector; transportation (freight and passenger); and industry and power sector), by 2025 the emissions can be decreased by approximately 60%. Whilst that is being undertaken, the Putrajaya case as well as Malaysia as a whole will be convened concurrently. This will then involve the same team i.e. the Japanese and UTM research team to collaborate with the Federal Department of Town and Country Planning (FDTCP) and Perbadanan Putrajaya (PPJ) teams.

The study team then set the base year for Malaysia & IM Study areas at 2005, whilst the target year for Malaysia & IM Study areas is 2025. An integrated model/tool called extended snapshot tool (ExSS) was used in the study to design social accounting matrices, energy balance tables, GHG emission and reduction tables of the target societies. From the last training workshop on LCS held in NIES, Tsukuba, Japan (August, 2010) the team has carried out new data entry, and running of model in ExSS (with its status of the progress as in ():

- a. Base Year Data
 - i. Malaysia (Complete)
 - ii. IM (Complete)
 - iii. Putrajaya (Semi complete)
- b. BaU Case
 - i. Malaysia (Semi complete)
 - ii. IM (Semi- complete)
- c. Counter Measure (CM) Case
 - i. Malaysia (Not complete)
 - ii. IM (Not complete)

From the research, in becoming a LCS, Malaysia will need to look at actions that are:

- Action 1: Walkable, Liveable, Green City
- Action 2: A Green Environment/ Nature Conservation
- Action 3: Low Carbon Lifestyle
- Action 4: A Green Economy
- Action 5: Integrated Transportation
- Action 6: Energy-efficient Buildings
- Action 7: Land Use Planning

Whilst the main dilemma of developing countries, particularly Malaysia is economic development that resulted in carbon foot print, we have to take advantage of clean technologies, energy efficient technologies, as well as cost effective renewable energy that allow us to expand our economics while curbing emissions. This issue was raised in the Expert Talk session (21st May 2010) organised by the FDCTP and the key word to the solution would be recapling. But then again, the bigger issue is how do we do recapling from the development and its CO₂ emissions. The adoption of EE (Energy Efficiency) and RE (Renewable Energy) would be able to solve the current problems because current technologies are available to us. We need to think of proactive measures that will help us reduce carbon emissions without jeopardising our economic growth. Fortunately, the current New Economic Model (NEM) is about moving our industry to innovation in economy that emphasises on service industry which has less carbon

demand/emission compared to many earlier industries.

CHALLENGES AHEAD

In becoming a LCS, Malaysia will inevitably face the following challenges:

- How will the models (ExSS) help to reduce Malaysia's CO₂ emission up to 40% carbon intensity of GDP by 2020?
- How to translate/interpret the results into policies and proposals?
- What does Malaysia need to do in order to get its citizens working towards the same direction?
- Can Malaysia afford and achieve what is set for within this time to develop the technology that can really change the graph?
- A road map and master plan in GHG reduction for Malaysia would need to highlight the action plans and roles of each agency particularly the local authorities; the model of each city level

specifying the mitigation measures and adaptation policies to be undertaken and the budget needed to implement identified actions.

- The role of innovation and technologies in Malaysia. The cost of technologies is still high for us to install rain water harvesting equipment, solar panel etc. Hence, it is still out of reach by many.
- The integration model needs to incorporate inter-sector functions of KeTTHA, Economic Planning Unit (EPU), Department of Environment (DOE), FDCTP and universities. This involves capacity building and engaging the communities especially in changing community life style as each of us has a role to play.
- Thus, the main challenge is about changing life style not just by individuals but households and communities, so that we can achieve transformation at the national level by sharing experiences of LCS.

CONCLUSION

The current annual Greenhouse Gas (GHG) emissions in Malaysia will likely increase. Taking Iskandar Malaysia (IM), its annual GHG emissions are approximately 12.6 million t-CO₂, and in the BaU scenario it will increase to 45.5 million t-CO₂ or 3.6 times higher than that of 2005. Nevertheless, by adopting the mitigation options available, the emissions can be decreased to approximately 60% and suppressed to a 19.6 million t- CO₂ by 2025. The goal of developing IM as a Low Carbon Society is possible with the reduction of CO₂ emissions per capita. Likewise, the reduction of CO₂ emissions per capita will enhance the success of Putrajaya and Malaysia as a whole as Low Carbon Societies. To realise a LCS, Malaysia has to have new and bold policies; and commitment to encourage and promote businesses whilst citizens have to take countermeasures to lower emissions levels. More importantly, it is about changing the life style not just by individuals, households and communities but also corporate sectors such as companies and agencies.

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GREEN AREAS IN MALAYSIAN CITIES

PROVIDING OPEN SPACES WITHIN DEVELOPMENT – A CASE STUDY OF KUALA LUMPUR

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ABSTRACT

The Malaysian Government emphasizes the importance of open space provision in all Malaysian cities. The Town and Country Planning 1976 (Act 172) stipulates that open space for recreational facilities shall be taken into consideration in the preparation of statutory development plans such as Structure Plans and Local Plans as well as other development plans including Landscape Master Plans. This article highlights the provision of open spaces with a case study of Kuala Lumpur. It looks at the potentials and constraints of open space provision, the framework for green development strategy, green space planning and finally the aspiration of making Malaysia a Beautiful Garden Nation.



INTRODUCTION

Many people have seen the landscape that they grew up in, disappear. Many children of today will share that experience. It is the experience of loss of a shared past. Indeed landscape plays an important role in experiencing the identity of a district, city or country. It is accepted that landscape has been a source of inspiration for artists from practically every discipline: composers, film directors, poets, writers, painters, photographers and designers. Many artistic expressions are connected with the landscape. All of this makes the landscape a thoroughly alturas phenomenon. Since landscape is manifested in the work of so many different artists, it emphasises the deeper values in society. The landscape is thus a vehicle of values and it is very important to provide good quality landscape and green space for our society. In Malaysia, the provision of open spaces or green areas lies under the purview of government

agencies. There is no single agency that has been entrusted to monitor the requirement of open spaces since it involves planning, implementation and maintenance.

In Kuala Lumpur, the total estimated open space consists of about 6.5% compared to the total overall land use of 24,221.05 hectares. This green area includes open space and recreational areas. Overall, the total land use for open space has increased significantly by 169.6 percent from 583.93 hectares in 1984 to 1,579.56 hectares in 2000, although there has been a steady decline in public open space in the City Centre largely because of conversion to other uses. At this stage, there is still lack of expertise and coordination in planning, managing and conducting studies on urban green spaces. As a result, most of agencies have difficulties in interpreting and implementing the existing green space policies. In this regard, there is a need for

strengthening the institutional capacity and capability of the implementing agencies toward effective green space management. Although Malaysia has many green policies, the interpretation of these policies and their implementation still needs to be enhanced. There is lack in the coordination between the different government agencies. There is a need to increase the interaction and understanding between these agencies as well as other interested parties. Smart partnership would be beneficial for the private and public agencies in planning and managing green spaces towards vibrant and conducive city living.

At the planning stage, the Federal Department of Town and Country Planning Peninsular Malaysia suggested that 2 hectares of green spaces should be provided per 1,000 population in urban areas. Presently, Kuala Lumpur is recorded to have 0.36 hectare of space available per 1,000 populations in contrast to many western cities showing a higher standard ranging from 2.8-3.2 hectares of open space per 1,000 population. Table 1 shows the comparison of open spaces in major cities in the world. This green area includes all the open spaces together with the green networks (road reserve, utilities reserve and river reserve). Overall, total open space has increased significantly by 169.6 percent from 583.93 hectares in 1984 to 1,579.56 hectares in 2000. Although there has been a decline in public space in the City Centre due to conversion to other uses, efforts are being made to maintain and upgrade green areas in Kuala Lumpur.

Table 1: Open Space Indicator - Comparison

Major Cities	Indicator per 1000 population
Malaysia – National Standard (MPFN)	2 hectares
London	4 hectares
Melbourne	2 hectares
New York	2 hectares
Toronto	2 hectares
Open Space Indicator – Comparison	
Kuala Lumpur	0.36 hectares

Source: Perancangan Taman Awam Berskala Besar Bukit Kiara, Kuala Lumpur 2007

PROVISION OF OPEN SPACES AND GREEN NETWORK

The distribution of large open space, green area and green network in Kuala Lumpur is based on the availability of large publicly owned land that can be developed for that purpose. Parks and recreational areas are usually developed from ex-mining land, ex-landfill area and some are identified from forest reserves. Since the planning of recreational area and green space is based on the availability of publicly owned land, the location is usually far away from population concentration. The accessibility to the park is via means

of transportation. The ideal mode of reaching the park by foot, needs to be promoted by the authority. The distribution of open space is shown in Figure 2 showing that there are some parks in Kuala Lumpur which are not accessible by foot or public transport. Users have to drive to the park in order to enjoy the facilities. Taman Tasik Perdana and Taman Tasik Titiwangsa are some of the examples.

Figure 2 also illustrates that there is no significant connection of green network in Kuala Lumpur. This is due to the lack of integrated effort to create a network of green areas through connections of spaces alongside road

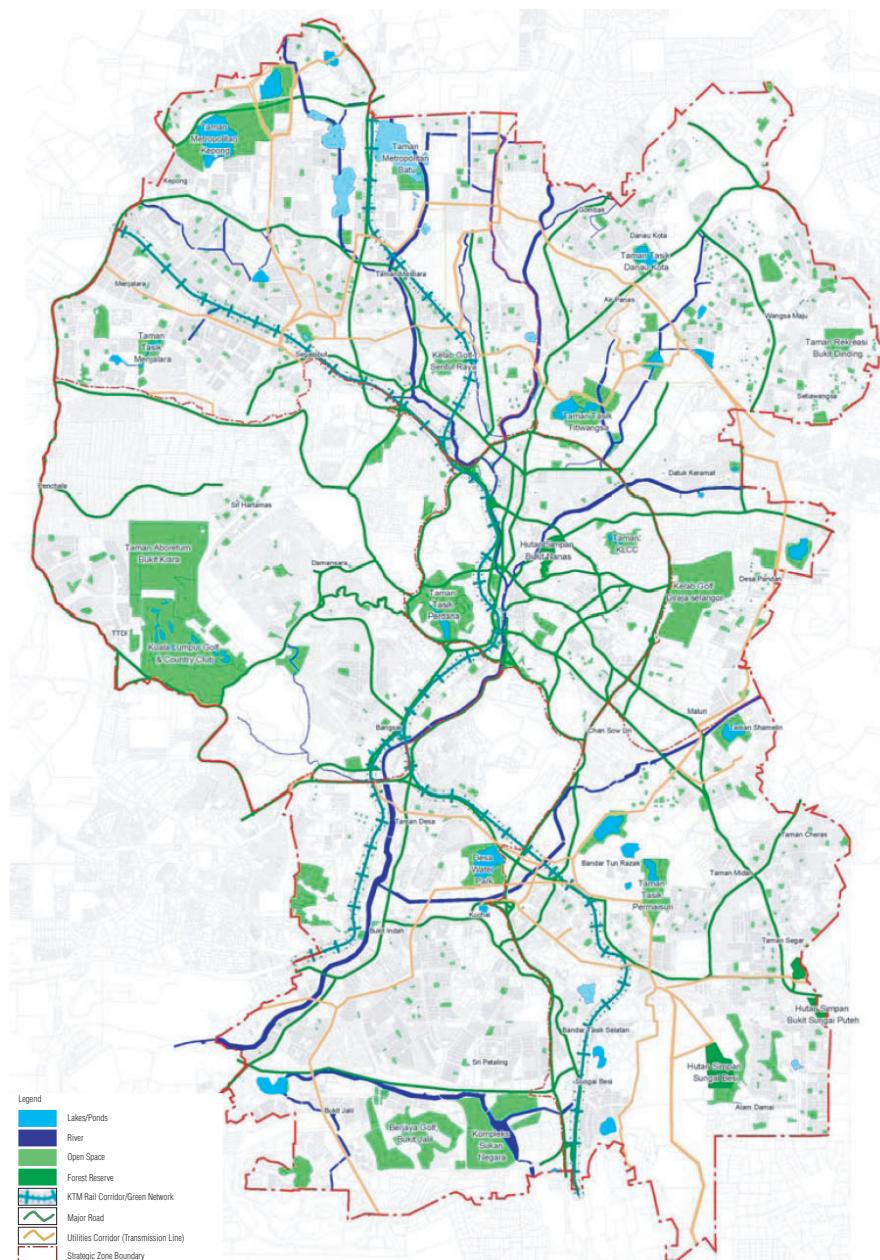
and highway reserves, river corridors, utilities and other public transportation reserve. Encroachment of other land uses on the infrastructure and utilities reserve has contributed to the declining amount of green connection in Kuala Lumpur. Provision of seamless pedestrian connectivity and green network needs to be addressed at the planning stage of development.

QUALITY AND POTENTIAL OF GREEN AREA

The distribution of parks in Kuala Lumpur are as follows:

- Lake Gardens
- Titiwangsa Lake Park
- Permaisuri Lake Park
- Batu Metropolitan Park
- Datuk Keramat Lake Park
- Bukit Jalil Park
- Pudu Ulu Park
- Kepong Metropolitan Park
- Manjalara Lake Park
- Rimba Kiara Park
- Lembah Kiara Recreational Park

Figure 2: Distribution of Open Spaces in Kuala Lumpur



Quantity of open space with manicured landscape is essential in modern living. Kuala Lumpur, still requires to examine the need in terms of quantity and quality. The number of open spaces provided by Kuala Lumpur City Hall is far below the one needed by its residents. Efforts to upgrade existing facilities in parks and gardens of Kuala Lumpur are essential in order to advocate garden tourism in the city. Each park has its own significant character that can be enhanced to attract users. Table 2 simplifies the potentials of each park in Kuala Lumpur.

Table 2: Potentials & Constraints of Open Space in Kuala Lumpur

Components	Constraint	Potential
Regional Park	Fairly distributed where every planning zone has at least one regional park.	Mostly can be accessed by private transportation (Taman Tasik Perdana).
	Insufficient utilities.	Potential for natural ecosystem conservation.
Town Park	Lack of vegetation. Fairly distributed. Fairly accessible by public transport. Inadequate facilities and utilities and moderate condition.	Distinctive characteristic of the park as in KLCC and the natural park in Taman Permaisuri.
	Maintenance needs to be upgraded.	Potential for natural ecosystem conservation.
Local Park	Fairly maintained.	Good accessibility and adequate distribution of facilities.
	Fairly distributed.	Large scale coverage enables more greenery to be applied.
Neighbourhood Park	Lack of vegetation.	Potential for natural ecosystem conservation.
	Lack of facilities utilities.	Potential green spaces in the neighbourhood as to enhance the living environment within the neighbourhood.
	Low maintenance services.	
Forest Reserve	Very limited area.	Potential green lung of the city.
	Bkt. Nanas Forest Reserve, Sg. Besi Forest Reserve & Bkt. Seputih Forest Reserve.	Natural habitat for biodiversity.

Source: Kuala Lumpur Landscape Master Plan, 2002

SPECIFIC FRAMEWORK FOR GREEN DEVELOPMENT STRATEGY

Kuala Lumpur will require more green spaces to qualify as a livable city. Current green space per person for Kuala Lumpur is 12m² which is significantly low as compared to other livable cities such as Melbourne (55m² per person) and Vancouver (22m² per person). Rigorous initiatives should be outlined for Kuala Lumpur which include the preparation of a Landscape Master Plan and to ensure its action plan is implemented.

The framework of a Landscape Master Plan includes drafting Policy Guidelines, Control Procedures and Landscape Management Plan. The most vital part of the Master Plan is the policy guidelines where it is used as a development reference for the area concern. This is to enable coordination among agencies and stakeholders involved in the development process. The guideline involves all development with landscape components. The Master Plan also provides the Landscape and Open

Space Management Plan in order to ensure the entire proposal can be realized within the context of good environmental management.

The Landscape Master Plan has outlined the blue-print of each area in line with the requirements as stated below:

1. To Integrate Green Space Systems in the Land Use and Urban Areas;
2. To Optimize Open Space Potentials and Projections to Meet Recreational Demands;
3. Drawing Policies and Measures of Nature Conservation Through Landscape Management Plan;
4. Promote and Highlight Ecological Approaches and Socio-Economic Potential to be Unravelled with the Local's Unique Landscape; and
5. Retaining Local's Tropical Character Towards Accomplishing 'Malaysia A Beautiful Garden Nation' Vision.

The listed responsibilities have been proven pertinent not only by providing areas for green spaces, but also in

enhancing a place's value in ecological aspects, heightening awareness and understanding regarding the importance of landscape as well as environment to stakeholders.

To Integrate Green Space Systems in the Land Use and Urban Areas

The lack of consideration towards providing ample urban green space systems has been an intimidating issue, particularly in the city centre. Nevertheless, in preparing the landscape master plan, detailed studies have been carried out to identify the ideal and proportionate acreage for open space, landscape conservation area and recreational demand. In conclusion, the study formulates an inter-connected green space system, held by the mutual newly-proposed landscape concept, in line with its local character and image. Landscape planning in Kuala Lumpur needs to be strengthened in order to influence turn Kuala Lumpur into a greener city.

To Optimize Open Space Potentials and Projections to Meet Recreational Demands

Open Space hierarchy needs to be adopted in every aspect of development to ensure sufficient green and open areas are provided to the people. The Malaysian National Physical Planning Council (MPFN) also has fixed the standard to have at least 2 hectares of open space per 1,000 population. The distribution is further parcel out based on space requirement and hierarchy of open space as shown in Table 3. In landscape planning, the same structure is used as a reference to gear the open space identification in each area. Authority responsible for residential and commercial development in Kuala Lumpur should identify the deficiencies in the current open space distribution and start to plan for future provision based on the MPFN standard.

In 1996 and later, in 2008, a National Landscape Guidelines for various sectors in urban area, as well as green areas and open space planning was released; that promoted the implementation of green components to be integrated with land use. Apart from analysing issues arised, the Landscape Master Plan also stresses on building an integrated system of open spaces, planning for urban parks, utilizing rivers and lakes, forests,

Table 3: Hierarchy of Open Space

No.	AREA	SPACE REQUIREMENT
1.	Playlots (Lot Permainan)	Min 0.2-0.6 ha
2.	Play Field (Padang Permainan)	Min 0.6 ha
3.	Neighbourhood Park (Padang Kejiranan)	Min 2.0 ha
4.	Local Park (Taman Tempatan)	Min 8.0 ha
5.	Urban Park (Taman Bandar)	Min 40 ha
6.	Regional Park (Taman Wilayah)	Min 100 ha
7.	National Park (Taman Negara)	No Limits

Table 2: JPBD Standards for Open Space and Recreational

Table 4: Deficiency of Open Space in the Klang Valley Region

Category of Park	Gombak	Hulu Langat	Klang	Petaling	WPKL	WLK
Play lot (number)	6	55	50	62	120	293
Acerage (hectar)	6.42	33.85	35.02	42.71	61.91	179.91
Neighbourhood Park (number)	1	16	26	45	35	123
Acerage (hectar)	2.44	36.64	49.12	110.02	63.82	262.04
Local Park (number)	0	1	0	4	3	8
Acerage (hectar)	0.00	13.73	0.00	71.84	58.60	144.17
Urban Park (number)	1	2	0	0	1	4
Acerage (hectar)	110.02	49.70	0.00	0.00	36.66	196.38
Regional Park (number)	0	0	0	0	1	1
Acerage (hectar)	0.00	0.00	0.00	0.00	92	92
Total Acerage of Public Open Space (hectar)	119.26	133.94	84.14	224.57	212.99	874.90

wildlife habitats, and scenic areas, restoring degraded land and natural systems, and protection of indigenous species. The basic principles of ecology have been widely used in green space planning.

Drawing Measures of Nature Conservation through Landscape Management Plan

Through the implementation of the Landscape Master Plan, it is mesmerizing to discover cities in Malaysia are abundant with unique landscape resources as well as social culture. Measures to monitor and safeguard the values of a place shall only be made abide by drawing stern policies to conserve them.

In landscape master planning, all considerations towards nature-related elements such as trees, wetlands, rivers and river banks, waterfalls, beach-lines and many others are taken into account. Through these,

the ecological potentials are identified and enforced. Other related policies and measures such as the Tree Preservation Order (TPO) are also stated in the landscape planning document as the main reference to users.

Promote and Highlight Ecological Approaches and Socio-Economic Potential to be Unravelled with the Local's Unique Landscape

Social life styles have great influence on the landscape of a place. Apart from the landscape's physical analysis, studies on local culture as well as their present well-beings are also taken into account. Their relationship with or without nature has been the highlighting point to determine whether to enforce a remedial plan or to conserve the unique human-nature bond.

Retaining Local's Tropical Character Towards Accomplishing 'Malaysia A Beautiful Garden Nation' Vision

Kuala Lumpur needs to be developed as a Tropical City which possesses outstanding parks and gardens, significant collection of tropical trees specimen, avenue of tropical rain forest species, interconnected green open spaces and network of vegetated pedestrian walkways. The crucial direction is for Kuala Lumpur to retain its Tropical Character.

OPEN SPACE - IS IT ADEQUATE?

Green initiative calls to improving the quality of life for all which at the same time allows for economic development to prosper. This initiative has been initiated since early 1970's. Though tremendous efforts and campaigns have taken place, the level of success to greening the cities in Malaysia is still below the international standard. Table 4 illustrates the deficiency in all categories of parks. There is only one regional park gazetted in the whole of Klang Valley. The provision of essential public facilities in terms of both quality and coverage needs to be strengthened.

WHY WE NEED MORE OPEN SPACE?

In line with the Government policy and to ensure cities in Malaysia embrace international standard with generous amount of open space, efforts to benchmark successful initiatives in other parts of the world are necessary. Studies show that there are relative increases of property value in areas which compose good landscape environment. In Japan, data from the cities of Tokyo and Kitakyushu were used, which are typical of large metropolitan areas and medium-sized cities to evaluate 200–300 transacted vacant sites, designated for residential development. The results of principal component analysis and hedonic regression analysis suggested that, in either city, the compatibility of buildings and the greenery of the neighborhood were distinctively perceived; these factors significantly influenced the land prices in both cities. The outcomes indicate that programmes should be provided to motivate residents to preserve or create landscape amenity cooperatively, and justify planning

policies to encourage neighborhood-based cooperation for landscape improvement.¹

An attractive environment is likely to influence the house prices. Dwelling in attractive settings will have an added value over similar, less favourably located houses. This effect is intuitively felt, but does it always occur? Which of the environmental factors make a location an attractive place to live in? A study in the Netherlands explored the effect of different environmental factors on house prices. The research using hedonic pricing method to analyse 3000 house transactions, in eight towns in the Netherlands, were studied to estimate the effect of environmental attributes on transaction prices. Some of the most salient results show that the largest increase in house prices is due to environmental factors (up to 28%) for houses with a garden facing water, which is connected to a sizeable lake. It demonstrates that a pleasant view can lead to a considerable increase in house price, particularly if the house overlooks water (8–10%) or open space (6–12%). Observation revealed that house price varies by landscape type. Attractive landscape types were able to attract a premium of 5–12% over less attractive environmental settings.²

INTENSIVE EFFORTS IN GREEN SPACE PLANNING

Cities in Malaysia need to outline a bold green development strategy in ensuring all cities to have a greater sense of place and community, its landscape heritage and building will be protected and there will be more open space and new parks with access for all. National Landscape Department has developed a Landscape Master Plan for some cities to translate green development strategy into action. Green areas or open spaces will provide good support system with a range of flora and fauna that will increase biodiversity and minimize adverse environmental impact. A healthy, bio-diverse environment is essential to maintain water quality, air quality, soil formation, plant regeneration, nutrient cycle and decomposition of organic material. A robust, biologically diverse environment will enhance a city and make it a more comfortable place to work, live and visit. Some key

directions that will help to increase biodiversity in city's green spaces are:

- to provide a continuous green network of open spaces. The provision of continuous green network of open space needs to be supported with a recreational action plan. The action plan will outline optimum use of spaces primarily focused on delivery improved recreational and leisure opportunities within the context of good environmental management. The network facilitates a green web of high quality pedestrian combined with vegetated area running through cities.
- to develop pocket parks and plazas in City Centres and urban centres. Generous amount of open space is an important community asset that plays a significant part in economic life of the city that attracts many tourists. Parks, gardens and plaza can contribute psychological, emotional and spiritual benefit to the society. Land use decision making should also ensure that open space is equitably distributed across the city.
- to promote and encourage vertical landscape. Urbanisation will continue to increase in the future due to the increasing demand for urban activities. A radical effort should be encouraged in anticipation to emerging future trends and change the management of our open spaces in future. Vertical landscape and roof top garden is now creeping Malaysian cities. It is a good sign of development that nurture healthy and livable cities.
- to retain and maintain matured trees found in all areas and ensure that the character of designated areas which have a preponderance of matured trees is preserved. Tree species with greater foliage, that will be more balance to local climate, will provide shade and aesthetic value to urban setting heritage attribute. Retaining old landscape and preserving heritage tree are noble effort since a city environment reflects its culture, history, community values and lifestyle. Taiping, George Town and Sandakan are examples of towns which their characters have been associated with heritage trees.

¹ Xiaolu Gao, and Yasushi Asami, Institute of Geographical Sciences and Natural Resources Research, Chinese Academy of Sciences, 11A Datun Road, Chaoyang District, Beijing 100101, Chin

² Center for Spatial Information Science, University of Tokyo, Kashiwanoha 5-1-5, Kashiwa, Chiba 277-8568, Japan

² The value of trees, water and open space as reflected by house prices in the Netherlands

- to intensify the programmes of roadside and street side planting and landscaping of open space and recreational areas. Trees and other vegetation on street, median and private compound play an important role in urban environments. Vegetation contributes to the aesthetic harmony of the city and helps to create a pleasant environment for social activities. Tree Planting Policy needs to be formulated for every city to increase tree planting, manage tree stocks to a high standard and plant greater diversity of tree species.
- to conserve residual forests to maintain a sustainable variety and population of wildlife within the city boundaries. Heavily developed urban areas are facing challenges to preserving and enhancing their green spaces. A particular challenge is to protect and encourage long term survival of small number of residual forests in the city. Protection of remnant forest ecosystem in the city can be intensified by increasing community awareness on the importance of forest conservation. The National Landscape Department has embarked on the community forest tree conservation programme in the Federal-owned park in Bukit Kiara.

GARDEN NATION: BUILDING VIBRANT AND LIVABLE NATION

The aspiration of making Malaysia a Beautiful Garden Nation has been progressing well since the vision put forward in the late 1990's. This vision needs to be supported by a drastic change in the mindsets of our society towards landscape and planning for green areas. Strategic thrust has been forwarded to the Government to consider of building a more vibrant and livable nation, as follows:

1. To persistently promote and improve Malaysian landscape development parallel to the Garden Nation Vision equipped with sufficient and functional *Green Infrastructure* for the benefit of people.
2. To conserve and preserve our precious natural resources as one of the main programmes in ensuring those unique national assets are in safe hands.
3. To ensure that landscape is taken as a fundamental requirement in all programmes and projects.
4. To review the legislations and monitoring procedure for matters related to landscape.
5. To strengthen the landscape industry - which eventually will progress to promoting research and development related to landscape.

CONCLUSION

Hence, to achieve the aspiration of turning Malaysia into a Garden Nation, the National Landscape Department (NLD) has outlined a few strategies to complement related national efforts towards green development such as to introduce and implement Green Space Index during planning, development and management phases. Apart from that, the NLD is also looking forward to the requirement of producing Development Proposal Report or LCP (a compulsory document before any physical development to progress) to analyse the existing landscape meticulously and to ensure the development proposal for a particular site is well-blended with the existing landscape. This proposal is intended to ensure Malaysia's natural landscape resources and its uniqueness be secured in a proper manner. However, these strategies shall be a success with strong supports from other professionals such as town planners and architects; which share the same commitments.

While holding to the present vision of making Malaysia a Beautiful Garden Nation, there is a crucial need to progress, develop and manage landscape in a sustainable way. The main aspect to be placed beyond the vision is that our **mindsets** and **perspective** to be upfront and passionate in making Malaysia not just a Garden Nation, but a nation that is rich with unique landscape characters.

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The value of trees, water and open space as reflected by house prices in the Netherlands

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Do people really keep hard copies of old conference proceedings? And read them? Well, guilty or not, I was rummaging through old books that I owned, including a battered Toffler's 'Future Shock' in paperback which still had bits of sticky markers on pages that I liked. I also stumbled upon some old proceedings from the 22nd European Transport Forum (1994). There was this group of researcher's or imagineers perhaps, who had put together some pretty interesting scenario, even by today's standards.

It started with the point on environmental space and mobility. And the question posted was: **WHAT WOULD ENVIRONMENTAL SPACE CONSTRAINT MEAN FOR OUR CURRENT PATTERN OF MOBILITY?**

The following are situations from the scenario 'Limited environmental space'

- a. applying only high-technology solutions;
- b. putting all motorised traffic underground;
- c. negotiating limited mobility quotas; and
- d. reducing the speed of motorised traffic by 50%.

I reproduce here excerpts from the scenario-building exercise 16 years ago, in its original text.

A. LAND OF THE RICH (APPLYING ONLY HIGH-TECHNOLOGY SOLUTIONS)

In spatial terms, this "super-high-tech" city has the nature of a very dynamic city, with a large number of high-rise buildings and multi-lane highways running through the city with transport making use of advanced systems such as tube transport and telematics. Exhaust emissions and fuel use are kept to a minimum. Passenger transport is for the very rich, because it is very expensive.

The role of central government may be limited to managing mobility on the basis of market mechanisms. Promotion of the city as a hub of international distribution may play a key part in this scenario, and conditions are created to achieve this. The business community is the main actor, not only as an entrepreneurial force but also in the search for solutions to environmental problems. There is a strong belief in technology as a solution for environmental problems.

Among the public, there is a distinction between the 'have' and the 'have-nots' which creates a gap, causing more and more social tension.

B. UNDERLAND (PUTTING ALL MOTORISED TRAFFIC UNDERGROUND)

The Underland scenario makes a rigorous choice for underground transport and production. In and between the large cities, there is an extensive underground rail infrastructure, which allows much more space above-ground for parking, dwellings, cycle paths, etc. Since factories are often under the ground, public life is also partly conducted there. An increasing number of shops and other facilities are located in the metro stations. Transport is mainly collective. In this scenario, central government is the main actor, because such a large scale transformation could only succeed if it were centrally coordinated. Central government management comes in the form of planning and money. The image that emerges is one of a science-fiction city like Metropolis. The power of such an initiative first makes the business community both reticent and opportunistic. Government subsidies would encourage development of new techniques for subsoil construction. In this scenario, the public is forced to make major financial sacrifices in return for the new large-scale underground infrastructure. They accept them because they see no other solution for reducing the environmental impact of mobility.

C. LANDLAND (NEGOTIATING LIMITED MOBILITY QUOTAS)

In Landland, each individual is assigned a mobility quota, which is very limited and negotiable. Local markets spring up for the buying and selling of mobility quotas. At the same time, the public feels compelled to walk and cycle as much as possible. Limiting the number of kilometres that people can travel leads to both public and private lives becoming organised within small centres.

Central government sets real limitations as a result of the limited environmental space available for mobility. In addition, it decentralises much responsibility to local government. There are clear-cut limits within which local government is responsible for everything. Government manages mobility on the basis of the public's capacity to negotiate.

In this world, the public is a major actor. Individual citizens develop an active, assertive attitude in this new situation. They are able to handle the uncertainty and unpredictability of the market situation. The very small geographical radius within which they are able to act leads to an emphasis on local government.

The business community responds to this situation and participates actively in transforming the scale of activities from the international and national level to the local level. Technology follows the same trend. With the expansion of information technology, data and designs are interchanged, but production takes place on a local scale.

D. RESTLAND (REDUCING THE SPEED OF MOTORISED TRAFFIC BY 50%)

In Restland, the speed of traffic is halved. This has far-reaching consequences for the organisation of society. Vehicles are adapted to travel more slowly. A great deal of time is gained by combining transport with other social functions (such as sports and office functions in the train). Goods and passenger transport by water may gain much ground. As speed falls, so people's lives become less hectic.

Central government puts quality before quantity. There is a radical change in values. It manages mobility on the basis of the public's own feeling of responsibility and the maintenance of values. The business community responds actively to these new values. The public increasingly becomes the main actor in this world. The emphasis lies in the acceptance of values such as "slow but sure" and "quality before quantity".

END

...with the RMK10 budget focusing on hybrid and electric cars and with green technology taking the forefront and with heavy investments on the underground Mass Rapid Transit, which LAND are we?

PLANNING EVENTS

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Research and Development Division
Federal Department of
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Peninsular Malaysia

FEBRUARY 2010

1 Putrajaya Urban Conference Series 2010: Green Cities International Conference – Building Green Cities For Tomorrow

Date	23rd – 24th February 2010
Venue	Sri Siantan Conference Hall, Perbadanan Putrajaya Complex, Putrajaya.
Organisers	Perbadanan Putrajaya & Malaysian Institute of Planners (MIP)
Websites	www.ppj.gov.my/www.mip.org.com.my
Theme	Building Green Cities For Tomorrow

2 4th ANNUAL CITY DEVELOPMENT

Date	28th February – 1st March 2010
Venue	Grand Hyatt, Amman, Jordan
Organisers	Marcus Events
Websites	http://www.marcusevansassets.com/doc/pdfs/Ep_16011.pdf
Theme	Gaining insights into new perspective and strategic approaches for city development through sustainable initiatives and urban regeneration.

MARCH 2010

1 World Urban Forum 5

Date	22nd – 26 March 2010
Venue	Praca, Maua square – Rio de Janeiro, Brazil
Organisers	UN Habitat
Websites	http://www.unhabitat.org/categories.asp?catid=584
Theme	The Right To The City – Bridging The Urban Divide

2 Environmental Asia Conference 2010: Balancing Economic Development with Environmental Sustainability.

Date	30th – 31st March 2010
Venue	Nikko Hotel, Kuala Lumpur
Organisers	Asia Executive Programs Sdn. Bhd.
Websites	www.aep.com.my
Theme	Balancing Economic Development with Environmental Sustainability.

MAY 2010

1 Sustainable Buildings South-East Asia 2010: New Opportunities & New Challenges

Date	4th – 6th May 2010
Venue	KLCC Convention Center
Organisers	The Malaysia Green Building Confederation (MGBC) & Institute Sultan Iskandar of Universiti Teknologi Malaysia
Websites	http://www.mgbc.org.my/sb10sea/about.htm
Theme	New Opportunities & New Challenges

June 2010**1 World Cities Summit Singapore**

Date : **28th June – 1st July 2010**
 Venue : **Suntec Convention Center, Singapore**
 Organisers : **Centre for Liveable Cities and Civil Service College, Singapore's**
 Websites : **www.worldcities.com.sg**
 Theme : Liveable and Sustainable Cities for the Future.

JULY 2010**1 National Workshop: Social Impact Assessment Manual For Development Applications**

Date : **6th – 7th July 2010**
 Venue : **Hotel Royale Bintang Kuala Lumpur**
 Organisers : **JPBD and Malaysian Association of Social Impact Assessment (MSIA)**
 Websites : **www.townplan.gov.my**
 Theme : SIA

2 Shanghai Forum on Disaster Risk Reduction (DRR)

Date : **28th – 30th July 2010**
 Venue : **Shanghai**
 Organisers : **The UN International Strategy for Disaster Reduction (UN/ISDR), the UN Human Settlements Programme (UN-HABITAT), DevNet, and ICLEI (Local Governments for Sustainability)**
 Websites : **<http://climate-i.org/2010/08/02/unisdr-and-partners-organize-shanghai-forum-on-disaster-risk-reduction/>**
 Theme : Disaster Risk Reduction (DRR) for Climate Change Adaptation

3 THE INTERNATIONAL CONFERENCE ON SUSTAINABLE COMMUNITY DEVELOPMENT 2010 (ICOSCD 2010)

Date : **20th – 22nd July 2010**
 Venue : **Putrajaya Marriot Hotel, IOI Resort, 62502 Putrajaya**
 Organisers : **Institute For Social Science (IPAS)**
 Websites : **<http://www.ipas.upm.edu.my/icosd2010>**
 Theme : Harnessing In Human and Social Capital Growth Towards Community Regeneration

AUGUST 2010**1 International Public Transport Conference**

Date : **2nd – 6st August 2010**
 Venue : **Borneo Convention Centre, Kuching, Sarawak**
 Organisers : **Malaysian Institute of Planners (MIP)**
 Websites : **www.mip.org.com.my**
 Theme : A Platform for Change

SEPTEMBER 2010**1 46th ISOCARP Congress**

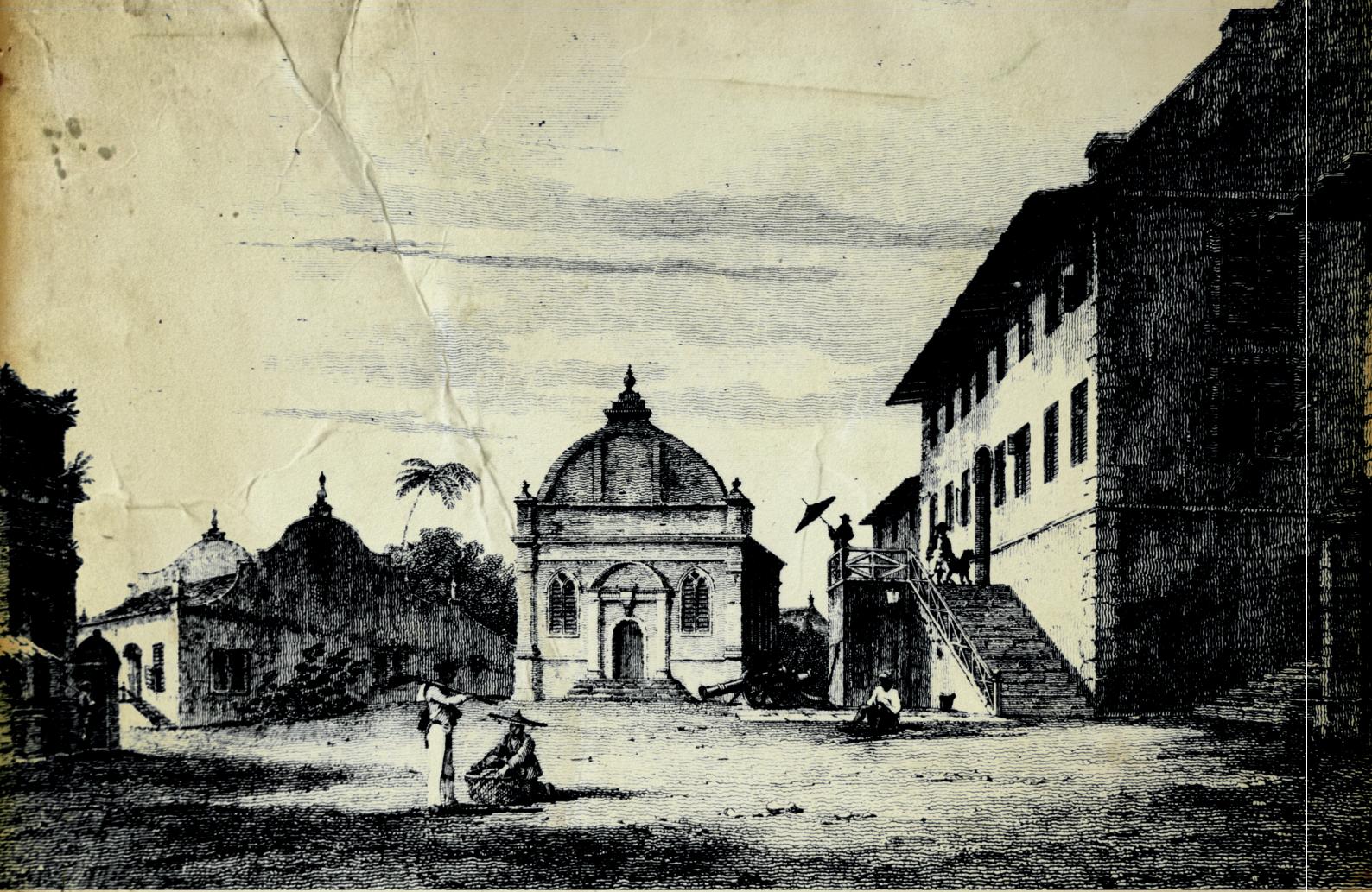
Date : **19th – 23rd September 2010**
Venue : **Kenyatta International Conference Centre (KICC) Nairobi, Kenia**
Organisers : **International Urban Development Association**
Websites : **<http://www.isocarp.org/index.php?id=548>**
Theme : Sustainable City, Developing World

OCTOBER 2010**1 50th EAROPH Golden Jubilee Congress**

Date : **31st October – 4th November 2010**
Venue : **Adelaide Convention Centre, North Terrace, Adelaide, South Australia**
Organisers : **Planning Institute of Australia, South Australian Division**
Websites : **www.earoph.info/pdf/adelaidepapers.pdf**
Theme : Cities and Their Regions: Catalysts for Change

NOVEMBER 2010**1 World Town Planning Day Seminar**

Date : **8 November 2010**
Venue : **Royal Chulan, Kuala Lumpur**
Organisers : **Federal Department of Town and Country Planning**
Websites : **<http://www.townplan.gov.my/>**
Theme : Sustainable Development - Green Neighbourhood



WITH THE CHANGING TIDES OF MODERNIZATION, MALACCA HAS SEEN MANY PHASES SINCE ITS EUROPEAN COLONIZATION TO MALAYSIAN INDEPENDENCE IN 1957. FROM ITS RUSTIC SETTING, MALACCA STILL BOASTS MANY OF ITS HISTORIC ARCHITECTURAL FEATURES INFUSED WITH MODERN DEVELOPMENT. THIS GLOBAL TOURIST HOTSPOT HAS BEEN LISTED AS A UNESCO WORLD HERITAGE SITE SINCE JULY 2008.



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