04

SELANGOR STATE STRUCTURE PLAN: STRIVING 2035

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ABSTRACT

The State Structure Plan (SSP) is a document that prepares a planning framework that guides and controls the physical development of the state, as required by the Town and Country Planning Act of 1976 (Act 172). The study area is in Selangor state, located on the west coast of Peninsular Malaysia. This study adopts the state of Selangor's structure plan preparation process in line with PLANMalaysia's Manual. The development concept proposed in the plan is "Polycentric Development Corridor," defined as more than one economic centre interconnected. Four new industrial corridors along the ECRL railway, four new command centers, and conservation in the ESA zone are proposed under the development concept. The study proposed three development thrusts with 15 policies. From the policies, 12 high-impact projects are proposed for the state of Selangor.

Keyword: structure plan, development plan, planning system, Selangor, Polycentric Development Concept
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INTRODUCTION

A State Structure Plan is a gazette planning document to drive and control the physical development of a state. A Structural Plan is defined as a written statement that explains the policies and strategic proposals at the state level involving the development and land use in urban and rural areas; measures to beautify the environment; traffic communication and management; and improving the level of well-being, socio-economic and promoting economic growth. The State Structure Plan (SSP) also contains other matters prescribed or determined by the State Planning Committee (SPC) and the National Physical Planning Council (NPPC) in a particular case. The SSP states the relationship between the proposals and the general proposals for the development and use of land in the adjoining states that may affect the state.

Selangor is located on the west coast of Peninsular Malaysia, bordered by Perak to the north, Pahang to the east, Negeri Sembilan to the south, and the Straits of Malacca to the west. The Federal Territories of Kuala Lumpur and Putrajaya are geographically located within the state of Selangor. Selangor, also known as Darul Ehsan, which means "Abode of Sincerity", is one of 13 Malaysian states. There are nine (9) districts in Selangor, which are Gombak, Klang, Kuala Langat, Kuala Selangor, Petaling, Sabak Bernam, Sepang, Hulu Langat, and Hulu Selangor (Maps 1 and 2).

Maps 1 and 2: Location Plan of Selangor State

METHODOLOGY

Figure 1 shows the process and stages involved in the preparation of a Selangor State Structure Plan 2035.

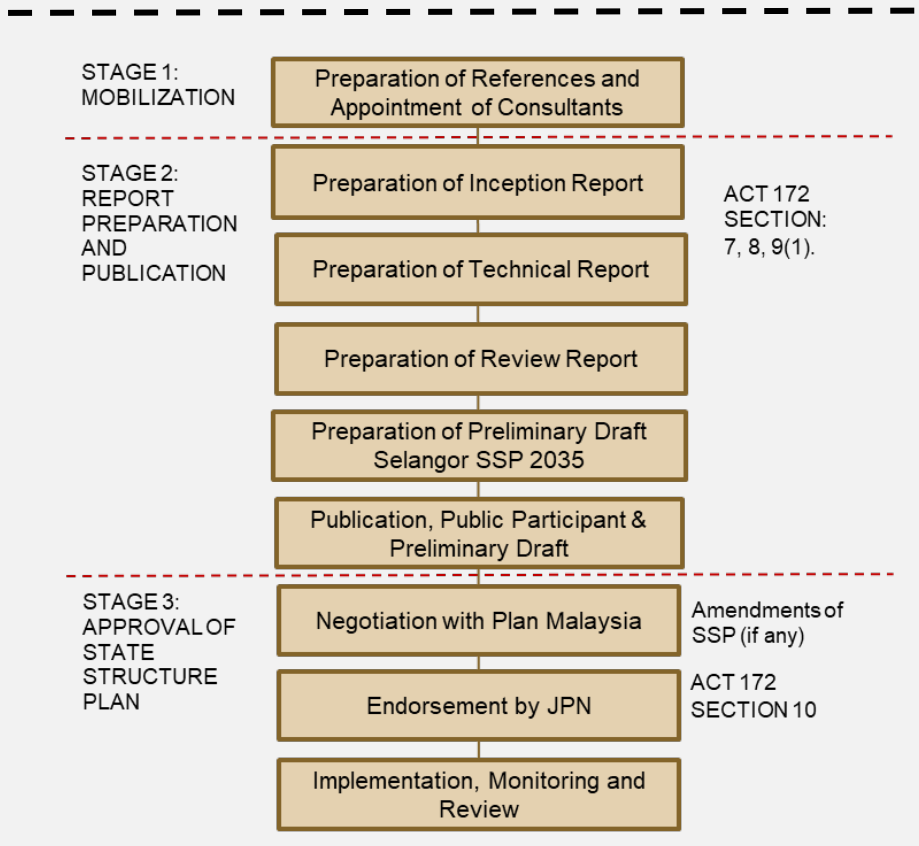
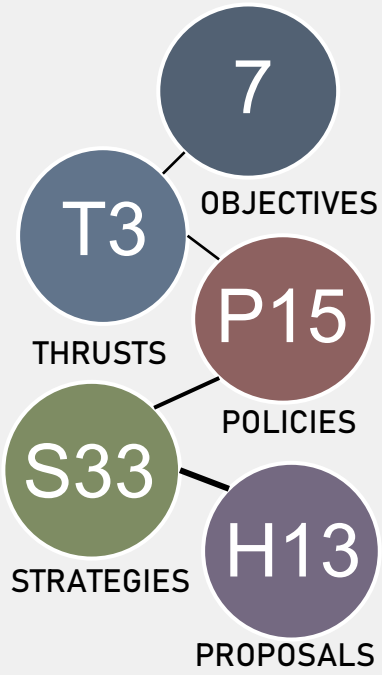


Figure 1 : Process and Stages involved in the preparation of Draft State Structure Plan

DEVELOPMENT GOALS



Empowering Selangor as a Resilient and Competitive State to a Global Extent

Based on the goals, seven (7) objectives have been highlighted to overcome the issues and prospects of Selangor state. Three (3) thrusts have been implemented coherently with 15 policies that have been renewed and improvised from the previous State Structure Plan of Selangor. Thirty-three (33) strategies and thirteen (13) proposals were proposed to make Selangor a resilient and competitive state to a global extent.

Development goals are formed based on the roles and importance of Selangor State in the context of Malaysia. The direction of the state development, including the state's vision and mission, was also formulated. In the development goal of Selangor SSP 2035, it was found that the economic activities in Kuala Selangor should be prioritized in line with physical, social and environmental development.

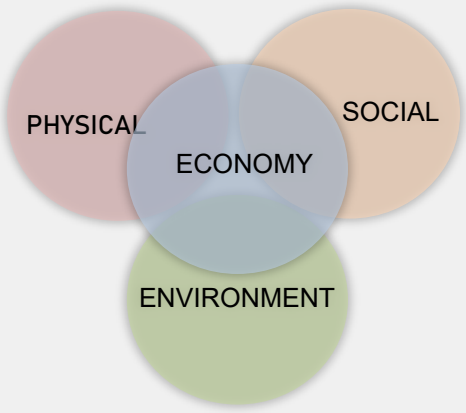


Figure 3 : Development goals

DEVELOPMENT OBJECTIVES

- **To strengthen the economic growth of Selangor**
- **To reduce disparities between the Northern and Southern Corridors in Selangor**
- **To increase the resiliency of Selangor for a sustainable future**
- **To enhance technological advancement, skilled employment, and attract foreign and local investment to form Selangor as the main economic contributor**
- **To address the population's housing and socioeconomic issues by establishing a safe and inclusive community in order to raise living standards.**
- **To establish an excellent transportation system with reliable connectivity and seamless traffic flow to fulfil the growing needs of the users.**
- **To control and prevent the encroachment of development on ESA areas to minimise environmental degradation.**

Figure 4 : 7 objectives of development goals

The draft report of Selangor State Structure Plan 2035 focuses on all eleven (11) planning sectors that were analysed and synthesised in the technical report. They are reflected in seven (7) objectives in line with the development goal of empowering Selangor as a resilient and competitive state globally by 2035.

DEVELOPMENT STRATEGIES

- Enhance smart infrastructure systems to promote sustainable development while bridging the gap between urban and rural areas.
- Renewable and green technology are utilised in water, electricity, sewage, and solid waste systems.

- Provide appropriate and affordable housing based on geography and income category.
- Reduce the economic inequality between urban and rural populations.
- Developing an IT-liberated community through the improvement of smart facility technologies.

- Elevate the marketability and strengthen Selangor's global economic competitiveness.
- Strengthen the industrial sector to increase the revenue of Selangor in the frontier technology sector.

- Managing Natural Disaster-Prone Areas.
- Control land use planning to protect environmentally sensitive areas according to ESA level.
- Conserve heritage values to retain the identity of Selangor.
- Managing ESA and conserving the natural resources

Figure 5 : Development strategies

DEVELOPMENT CONCEPT

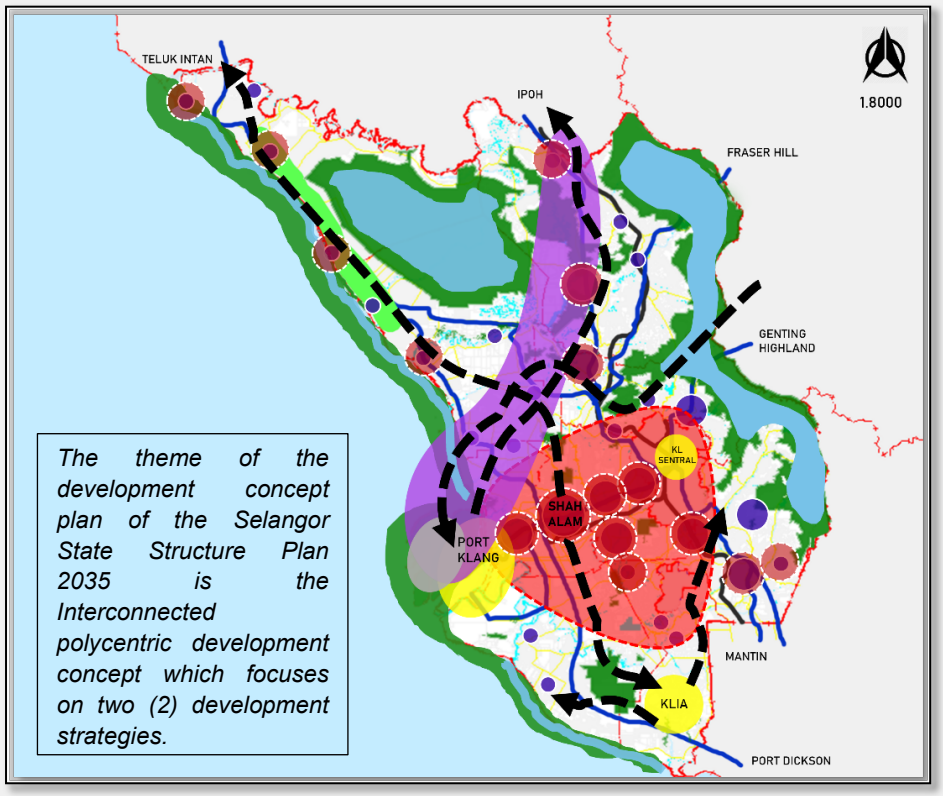
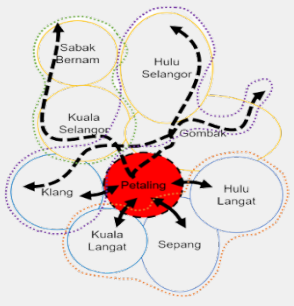


Figure 6: Development Concept Plan for Draft Selangor State Structure Plan 2035.

"INTERCONNECTED POLYCENTRIC DEVELOPMENT CONCEPT"

The polycentric spatial development concept is about each economic corridor and growth centre in the state depending on one another. Each corridor and centre has a different economic focus that directly and indirectly supports other economic sectors. The polycentric spatial development pattern expands from Greater Kuala Lumpur (GKL) and Klang Valley (KV), which function as key hubs for living, working, administration, services, and businesses. A perfect combination of main logistic and transit centres near GKL and KV are Port Klang, Kuala Lumpur International Airport and KL Sentral to boost the economy in Selangor state. As part of the Environmental Sensitive Areas (ESA), enhanced by eco-tourism activities, the new industrial linkages dynamically stretch out along the proposed ECRL Section C that has alignment and connects with existing industrial hubs in Hulu Selangor, Gombak, Petaling and Klang.



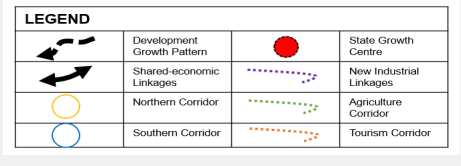


Figure 7: Development concept of Polycentric Spatial Development

DEVELOPMENT THRUST

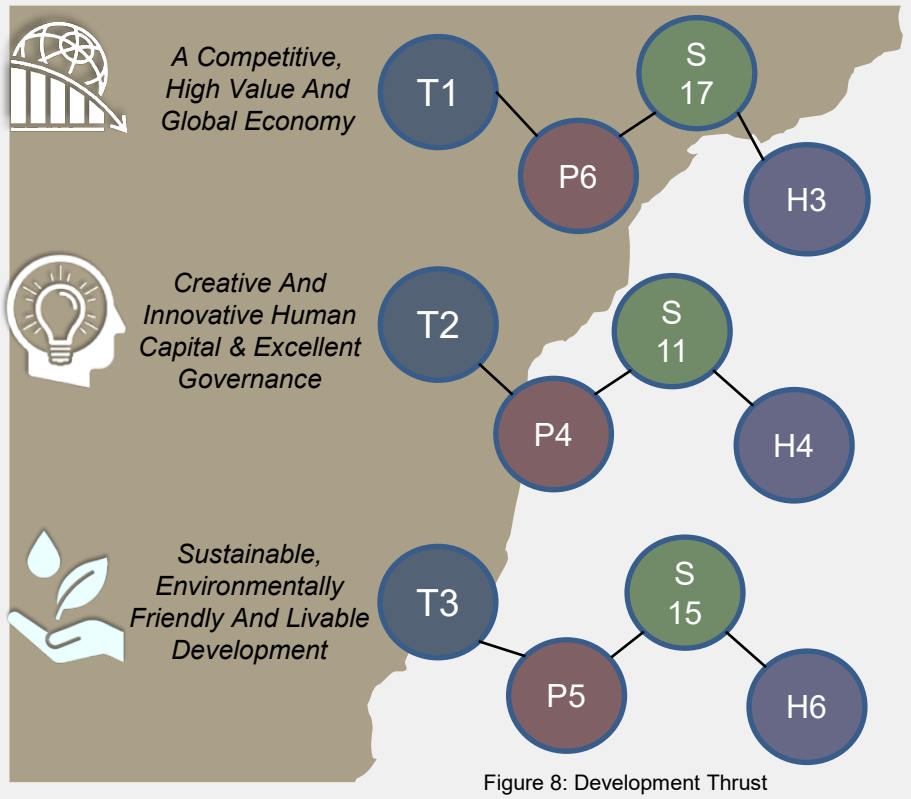


Figure 8: Development Thrust

DEVELOPMENT OVERALL PROPOSAL

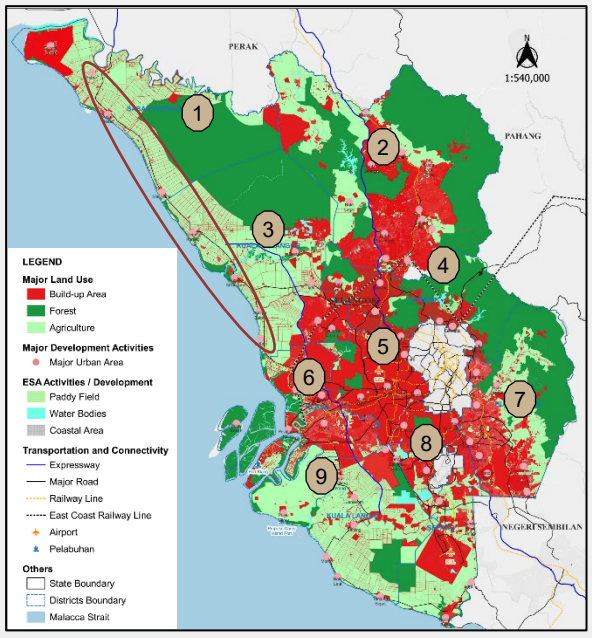


Figure 9: Map of overall development proposal

Bintara I-Learning Factory	6, 7
Klang Indera Sakti Eco Smart City	6
Laskar Subang Airport Regeneration	5
Multinational Maritime Coordination Centre	1
SMART Aquaculture	
Nakhoda Integrated Resource Research Centre Model	ALL
Nakhoda Drinkable Tap Water	ALL
Nakhoda Smart-Infra	2, 3, 7
Smart Selangor Command Centre	ALL
Nakhoda Living Lab	ALL
Restructuring Rumah Selangorku Scheme	ALL
Integrated School	6, 4, 8

The proposal implemented is based on the issues and prospects of Selangor state and tends to improve, protect, and boost Selangor's development to compete with other states and countries globally. The proposed development is located in a suitable district with a substantial opportunity for success.

HIGH IMPACT PROJECTS

PROJECT 1: BINTARA I - LEARNING FACTORY LEKIU SMART INDUSTRIAL CORRIDOR

These two industrial projects are proposed within the industrial corridor, as shown in figure 4.1. The Bintara I – Learning represents a realistic manufacturing environment for education, training, and research. Under the Smart Economy, all types of factories in Selangor must create and provide an i-Learn Factory Center within the factory perimeter. It is through this Bintara project that it will enable the workforce and students to be the future workforce with the required qualifications, and it will also show the importance of qualification and human resource development in industry 4.0. The Lekiu Smart Industrial Corridor is also proposed at Sabak Bernam and Kuala Selangor Light-Medium Industrial. There will be a mix of industrial sectors such as aerospace, research and development, food, and technology. This project can preserve ESA in Sabak Bernam and Kuala Selangor, helping the local population with industrial activities and communication between industrial activities that are integrated with all activities and sectors.

Issue

The unemployment rate in Selangor increased due to the pandemic that hit the whole country, which caused more people to lose their jobs. Moreover, even though Selangor is the largest employer, with 23.2% of total national employment (2018), another contributing factor to Selangor's rising unemployment rate is skill mismatch in the job market.

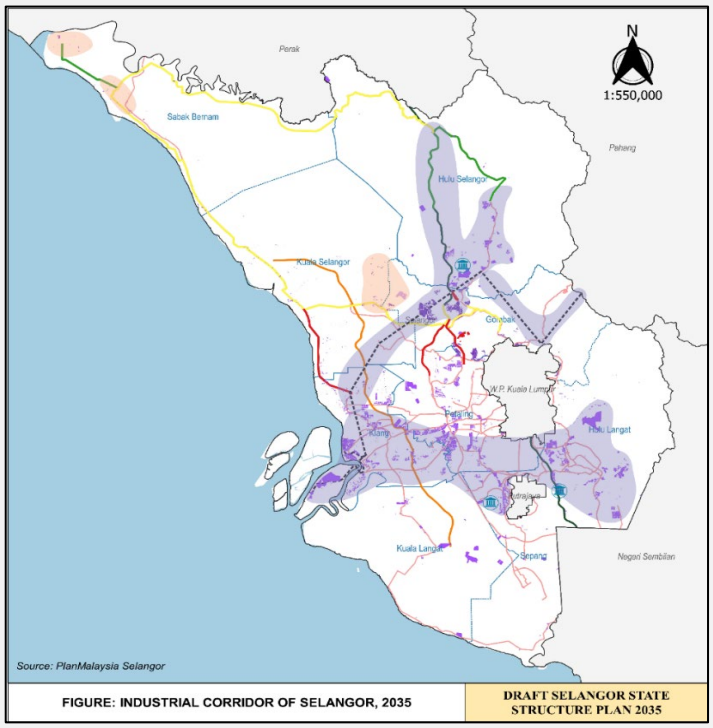


Figure 10: Proposed location of Tiger Shrimp Breeding project at Kampung Assam Jawa (Source: Draft Local Plan Kuala Selangor 2035)

Project Component

- Increase the productivity of all types of industries.
- Encourage research and technology transfer between international caliber companies.
- Increase the skilled workforce through training and qualifications.
- Encourage energy and resource efficiency in factories.

PROJECT 2: KLANG INDERA SAKTI ECO SMART CITY

This project consists of three (3) main components: Selangor Maritime Gateway, West Port Expansion & Carey Island New Port Development, and The Advancement in Party Logistics. Furthermore, the Selangor Maritime Gateway (SMG) will increase its 1.3 million population by 2030. The project also targets a statistically 4.7% increase in economic growth with about 6,600 new job opportunities. There is also the West Port extension and Carey Island's new port development. WESTPORT Holdings Bhd's Westport 2 expansion plan is expected to increase the port's capacity by 50% to 28 million twenty-foot equivalent units (TEUs) per annum by 2040. The Carey Island Port is a massive post-industrial city project with more than RM200 billion in infrastructure investments.

Issue

The Klang district is vulnerable to flood disasters. The Klang River is vital for Selangor, and this river is at risk of pollution. Port Klang is the international port of Malaysia and plays a significant role in sustaining the economy. Thus it is vital to ensure Port Klang is always in operation and not obstructed by any disaster.

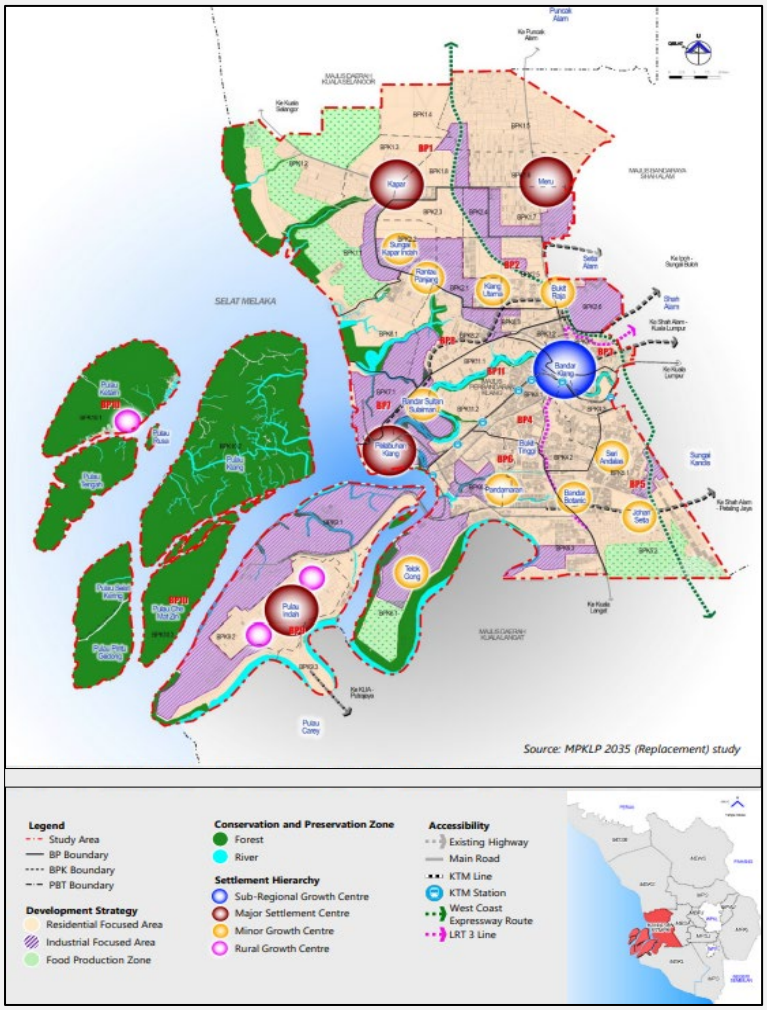


Figure 11: Optimum land use and natural resources dimension strategy (Source: MPKLP 2035)

Project Component

- Increase to RM55.2 billion of Selangor's GDP
- 32,00 job opportunities are created.
- Foreign and domestic investment totaling RM9 billion
- 20,000 skilled professionals.

PROJECT 3: LASKAR SUBANG AIRPORT

The upgrading project on Subang Airport includes additional components such as City Airport, Business Aviation Hub and Aerospace Ecosystem (Subang Aerotech Park). Through this project, 68.9% of investment in aviation will be located in Selangor, and 85% of MRO companies will also be in Selangor as Selangor soared into becoming a hub for aerospace engineering in Southeast Asia. Therefore, it is also vital for the major key players in Aviation Industries to be located in Selangor.

Issue

Some serious issues were highlighted in Subang Skypark: the limited capacity and capability of the current Subang Skypark. As a result, there is a clear need for expansion to meet the demand for business aviation, as Subang Airport has the potential to become a preferred aerospace and business aviation hub in the Asia Pacific.

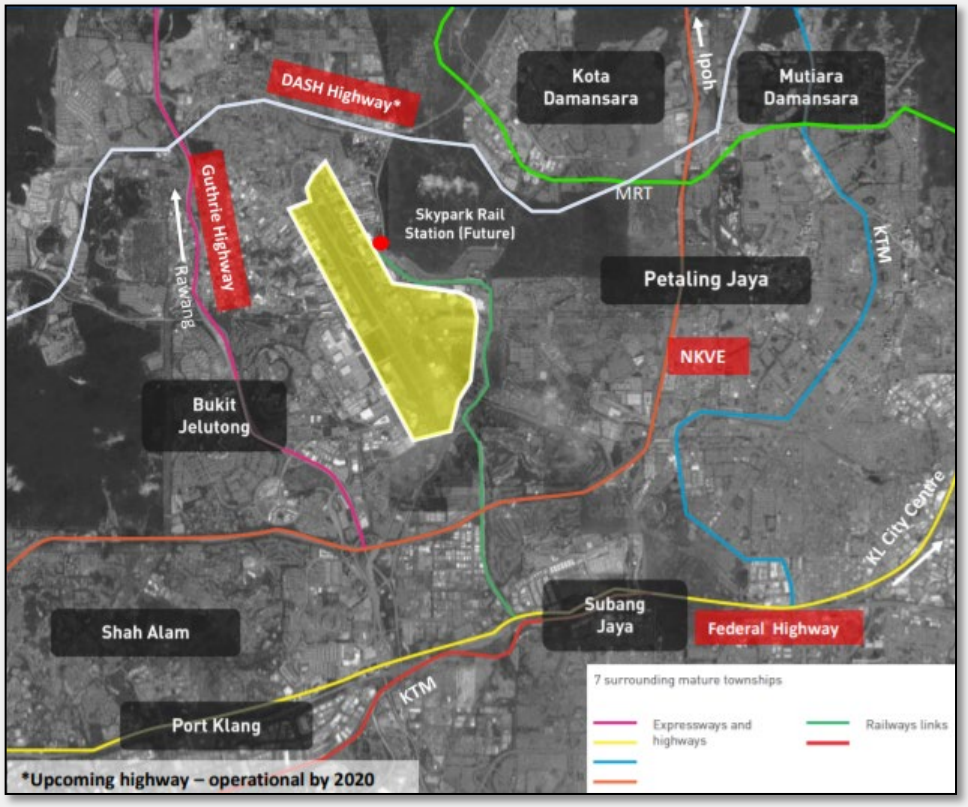


Figure 12: Proposed location of Subang Airport regeneration
(Source: www.theedgemarkets.com, 2021)

Project Component

- increase RM55.2 billion in Selangor's GDP.
- 32,000 new jobs are created.
- Foreign and domestic investments totaling RM9 billion.
- 20,000 skilled professionals.

PROJECT 4: SMART SELANGOR COMMAND CENTRE

Smart Selangor Command Centre's project focuses on upgrading and strengthening the existing command centre functionality. The upgrading includes developing new command centres at strategic locations, i.e., Kuala Selangor, Gombak, Petaling, and Sepang as the backup, as well as appropriate and efficient management of corridors under one system. In addition, the centre should also be able to provide better delivery of information and announcements.

Issue

The current Smart Selangor Command Centre is only located at Shah Alam and is not well distributed in other districts of Selangor. Since Selangor is developing rapidly, the approach to monitoring and enforcement needs to be upgraded throughout the state. The approach should also be cross-referenced with every relevant agency for faster resolution and better communication.

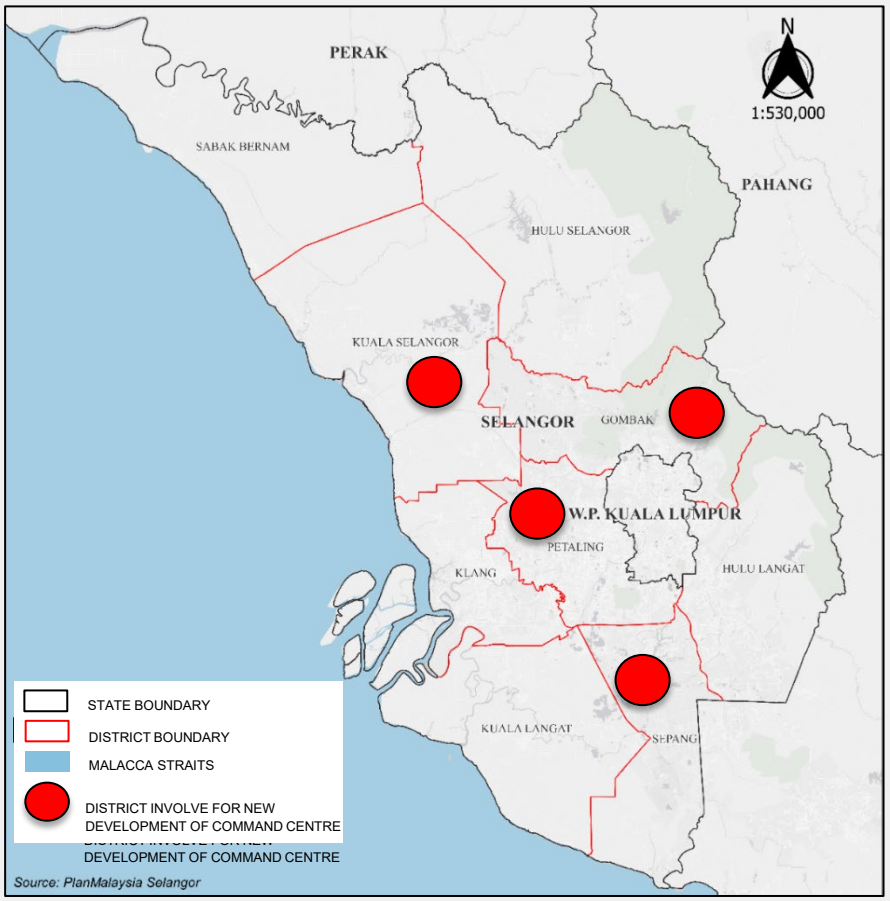


Figure 13: Location for proposed new command centre
(Source: Draft Local Plan Kuala Selangor 2035)

Project Component

- Open Data Bank in Selangor
- Selangor Intelligent Interfaces
- SMART CPTEDSAV (Shared Autonomous Vehicle) SMART
- SMART Bus Stop
- A solar electric scooter
- Feeder Bus System Restructuring

- Bus Stop Mechanism
- Simplified Bus Routes and Branching
- Bus Alignment (Bus Only Corridor)Off-Board Fare Collection
- Intersection Treatment for Buses
- i-SIHAT Selangor
- The Orbital Rail Network

PROJECT 5: NAKHODA LIVING LAB

Nakhoda Living Lab project is to encourage the use of the Smart Living Lab in all sectors, such as transportation, creative economic model, and social improvement. It involves the local community in town planning problem-solving through municipality-community integration. Through this project, the involvement of stakeholders and the community, especially youth, is encouraged. The lab will be able to train the community to be more innovative.

Issue

There is a growing trend to involve citizens in city development to make urban areas more adaptable to citizens' needs. When addressing the consequences of climate change and urbanisation in cities, such as air pollution, flooding, and heat stress, it is crucial to think ahead and, at the same time, consider the social implications of the solutions that are introduced in our urban areas. Addressing complex problems, such as climate change and its social implications, entails a wide range of aspects to consider. It should be addressed by involving various stakeholders, including citizens, companies, researchers, academia, and the public sector, to ensure collaboration toward shared solutions.

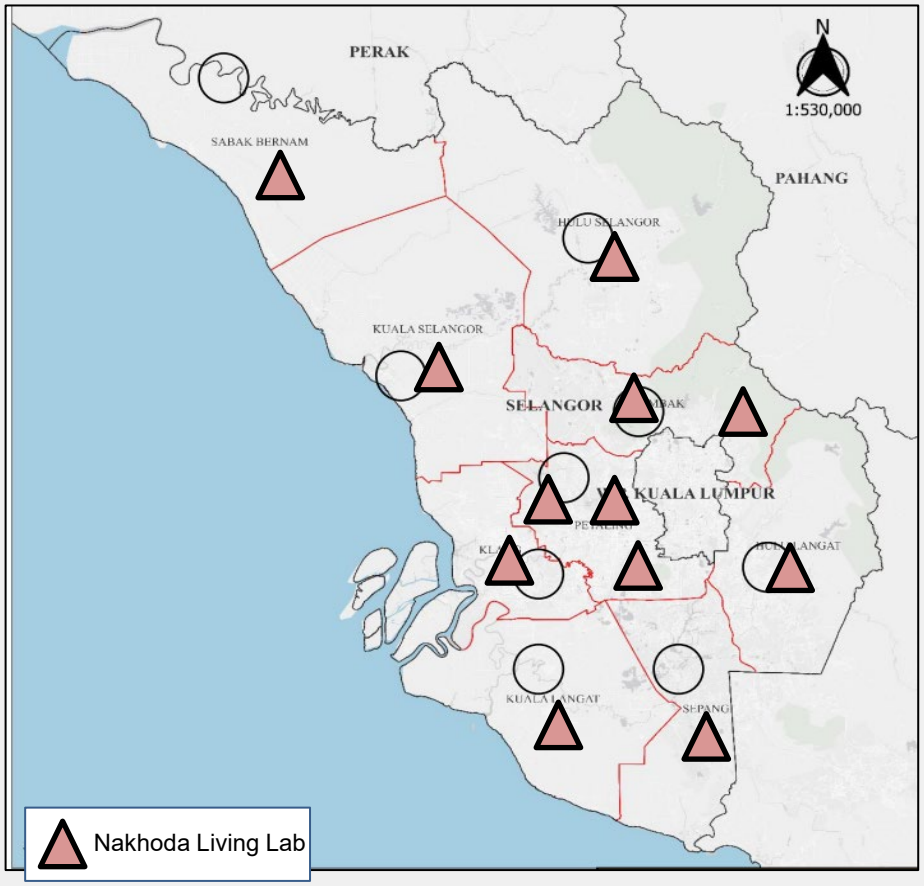


Figure 14: Proposed locations for Nakhoda Living Lab (Source: Draft Local Plan Kuala Selangor 2035)

Project Component

- Attract new investment
- Provide more job opportunities
- Boost local economic
- More innovation from Selangor community
- Selangor will be the first state that advance in the development

PROJECT 6: HOUSING REHABILITATION

The housing rehabilitation project aimed to address the current housing overhang by improving or redesigning the house and the facilities. According to PEPS, unsold housing is due to the indiscriminate building by developers—dwelling conditions such as housing size and facilities that do not meet the national housing standards, consequently affecting residents' quality of life. The large concentration of unsold housing is caused by the large concentration of low-income groups, the poor management of building facilities, and inadequate maintenance, resulting in poor living environments. To effectively rehabilitate abandoned or vacant housing, affordable housing should be redesigned and rehabilitated in line with the market demand. Facilities and services should be strengthened, thereby ensuring a better quality of life for residents and improving the quality of their living environment.

Issue

According to Selangor Housing and Property Board (SHPB), there are 111 housing projects in Selangor that were abandoned involving 15,010 housing units.

Figure 15: Example of Housing Rehabilitation Program in City of Walnut, California, United States (Source:https://www.cityofwalnut.org)

Project Component

- Increase household income
- Ensuring household economic self-sufficiency
- Creating job opportunities for low-income household

PROJECT 7: INTEGRATED SCHOOL

The Integrated School project is to provide integrated and graded schools to the districts that have an inadequate number of schools. Integrated schools will centralise all facilities in one place. The basic facilities such as fields, special rooms, gymnasium, canteen, toilets, teacher's room, office and others are placed in each school. This proposed multi-storey school will be more than 5-storeys and complete with all the facilities. The idea of a multi-storey integrated school will help to solve the insufficiency of primary and secondary schools in Gombak, Petaling, Klang and Sepang.

Issue

Schools in certain districts such as Gombak, Petaling, Klang, and Sepang are insufficient. Existing primary and secondary schools cannot accommodate the number of children in a particular district.

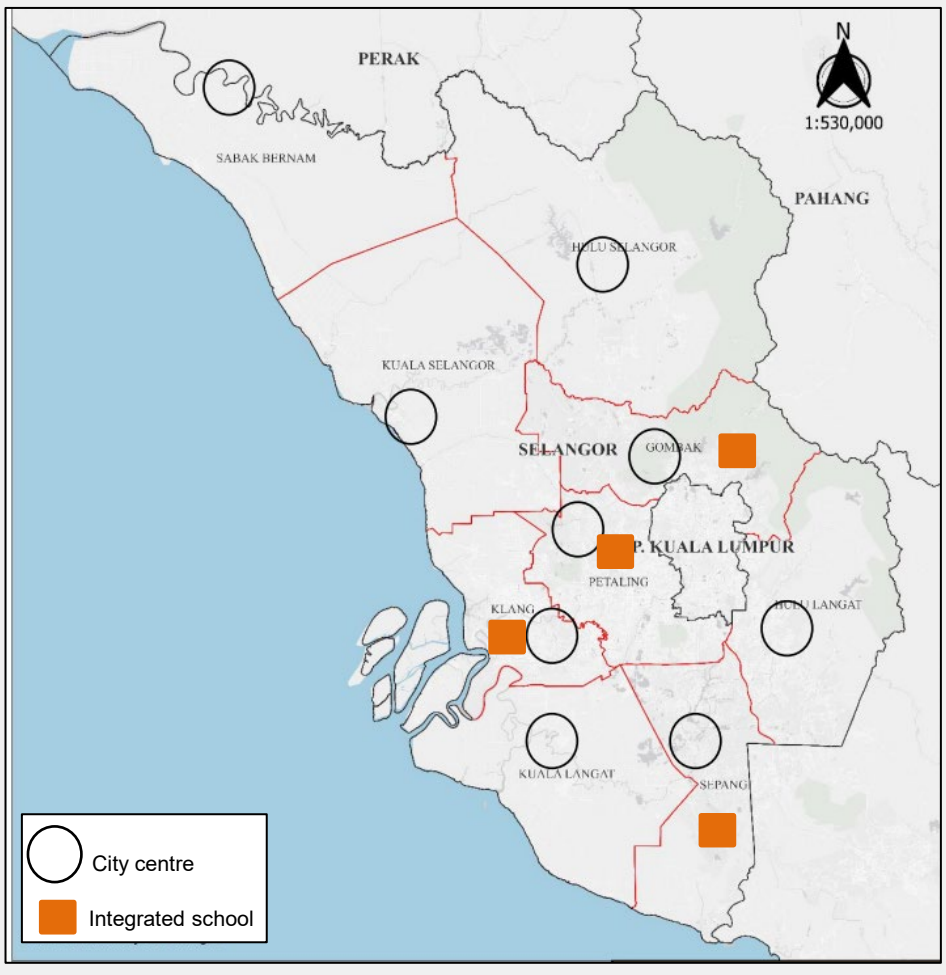


Figure 16: Location of the proposed integrated school
(Source: Draft Local Plan Kuala Selangor 2035)

Project Component

- Minimize the use of land
- Cater the population of affected districts

PROJECT 8: MULTINATIONAL MARITIME COORDINATION CENTRES

The Multinational Maritime Coordination Centre's project is located at Bagan Nakhoda Omar, Sabak Bernam. The centres cooperate with regional training centres and programmes for capacity-building relating to vessel inspection, safety, and security at sea. This project aims to prevent environmental crime, such as illegal fishing, overfishing, pollution, and ship emissions.

Issue

- Over the next 60 years, Malaysia's fish reserves will be greatly reduced by about 95% due to overfishing.
- The most destructive fishing gear is the trawl, which acts like a tractor raking the seabed.

Figure 17: Coverage of Multinational Maritime Coordination Centres
(Source: Draft Local Plan Kuala Selangor 2035)

Project Component

- Adequate Human and Institutional Capacity
- At-sea activity monitoring
- Coordination of surveillance communication
- Regional vessel monitoring Information

Figure 18: Illustration of Multinational Maritime Coordination Centres

PROJECT 9: AQUAEASY

Aquaeasy project proposes an Internet of Things (IoT) based smart aquaculture model that will measure water quality for aquaculture. A water recycling mechanism is also proposed to reduce the amount of aquatic waste. This work uses low-cost and short-range wireless sensor network modules to monitor and control aquaculture in real-time. Using this system will ensure the survival of aquatic life. It also ensures the quality of growth and increases the economic benefits of aquaculture.

Issue

- Aquaculture in Selangor has been declining in production over the past 10 years.
- Aquaculture farmers in Selangor still use the old method (manual) in farming.

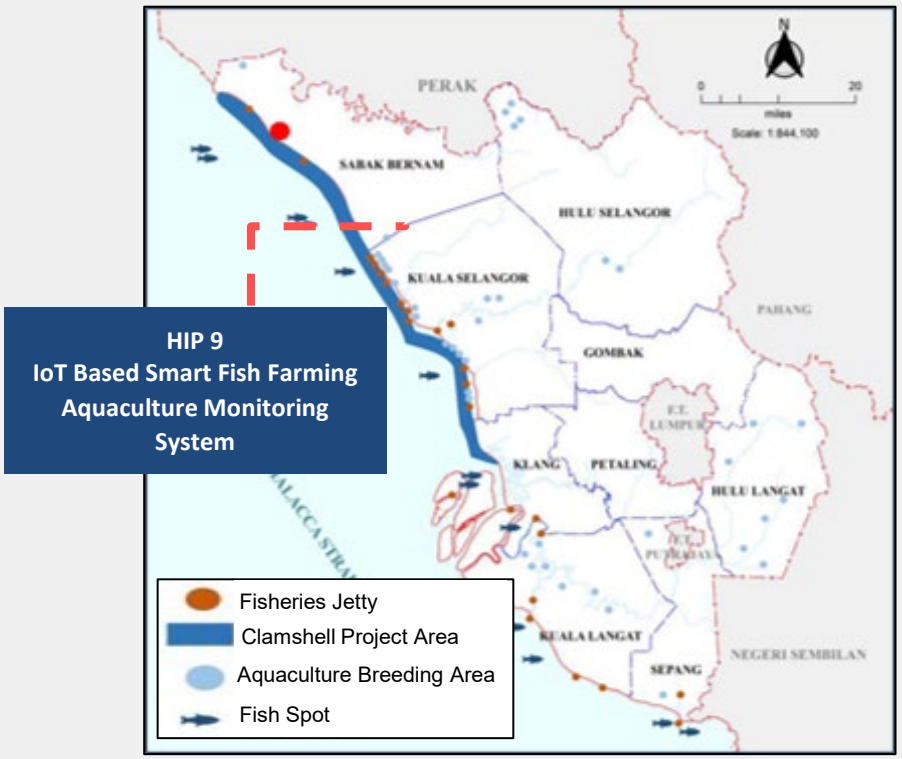


Figure 19: Coverage of Aquaeasy Projects
(Source: Draft Local Plan Kuala Selangor 2035)

Project Component

- The Internet of Things (IoT)
- Smart Aquaculture
- The water recycling mechanism
- Wireless sensor networks

Figure 20 : Project Components of AThe Internet of Things (IoT) –
Smart aquaculture the water recycling mechanism wireless sensor networks aquaeasy project

PROJECT 10: SOLAR TECHNOLOGY FARM

Solar Technology Farm projects are proposed at Kuala Selangor and Hulu Selangor. The panels capture the sun's energy throughout the day and direct it to a receiver filled with molten salt. When the salt temperature exceeds 1,000 degrees Fahrenheit, it stores the energy as heat for later use. Due to its geographic location, Malaysia experiences hot and humid weather with a generous amount of rainfall all year round. It also receives abundant solar radiation throughout the year, with most places having a daily average of 4.7–6.5 kWh/m.

Issue

- Particulate matter emissions from exhaust and non-exhaust sources, as well as gaseous pollutants from a variety of motor vehicle classes in Selangor.

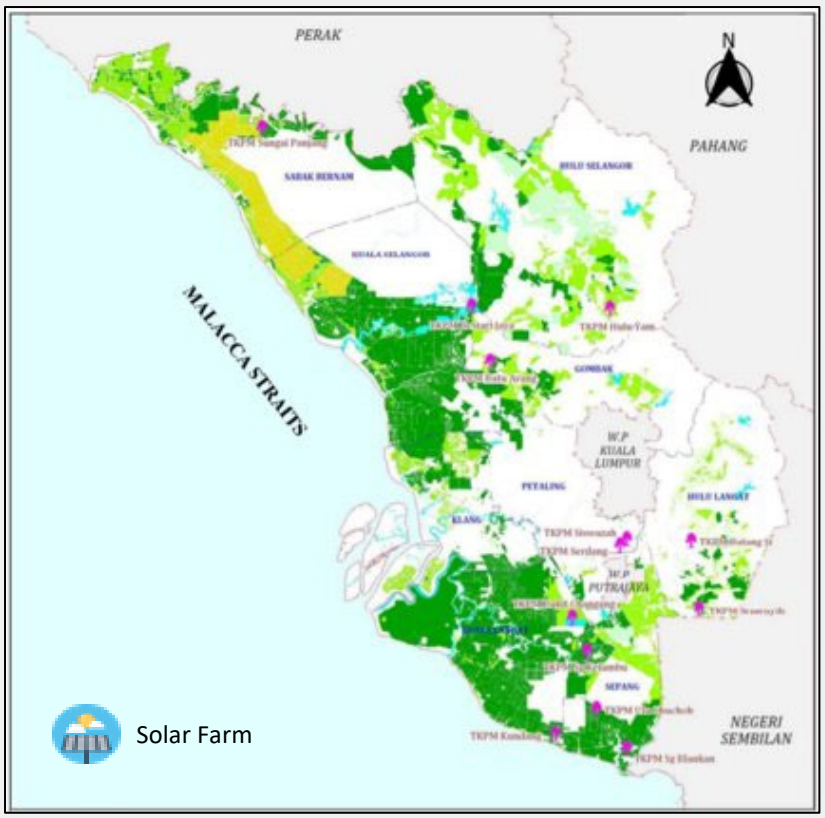


Figure 21: Proposed location of Selangor Solar Farm
(Source: PlanMalaysia)

Project Component

- Renewable and clean energy consumption.
- Renewable Energy Cycles
- Conversion of sunlight to electricity
- The Solar Photovoltaics (PV) method

PROJECT 11: NIRRC MODEL FOR WASTE

Waste segregation means sorting and separating waste types to facilitate recycling and correct onward disposal. When waste is sorted correctly, it can reduce operating costs. The NIRRC project model proposed an integrated resource recovery centre by introducing a distance catchment method based on the decision of trash bin placement that aims to create regenerated fibre from pre-consumer and post-consumer waste.

Issue

- Selangor is expected to generate 11,078 tonnes of solid waste per capita per day by 2035.
- 7 out of 9 disposal sites have exceeded their lifespan and are not able to cater to solid waste.

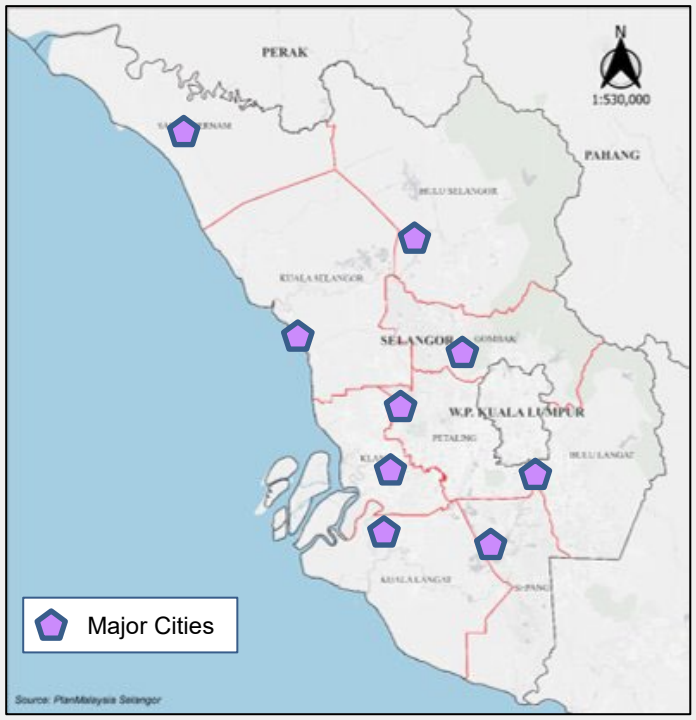
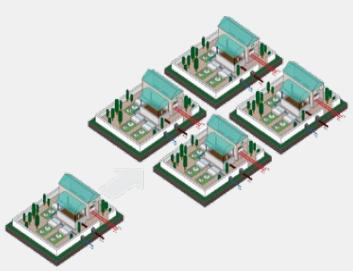


Figure 22: Coverage of NIRRC Model Projects (Source: Draft Local Plan Kuala Selangor 2035)

Project Component

- Waste separation at the source
- Sustainable waste collection and disposal
- Bigger capacity of waste storage
- Services for managing circular waste
- Trash-to-cash5R concept



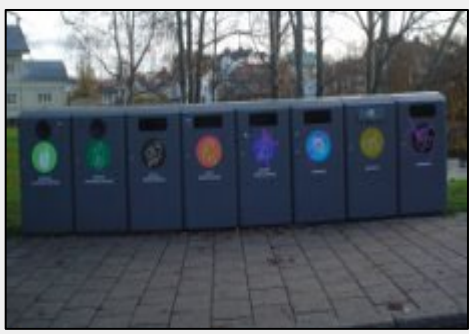


Figure 23: Project Components of NIRRC Model Project

PROJECT 12: DRINKABLE TAP WATER

The drinkable tap water project through Intelligent Aqua aims to solve water issues through ingenious technology. The process involves removing many types of dissolved and suspended contaminants. This project will convert the wastewater to clean water through circular osmosis. The technology can also detect leakages in the water piping system in real-time. This project involves changing the existing asbestos piping to the ductile iron/mild iron/polyethene piping materials, which have lower maintenance costs. The project will also resolve the issue of old broken pipelines aged 20–30 years old in Selangor.

Issue

- Replacing the water meter that needs periodic cleaning to maintain it.
- Low water quality and water interruption in certain districts in Selangor

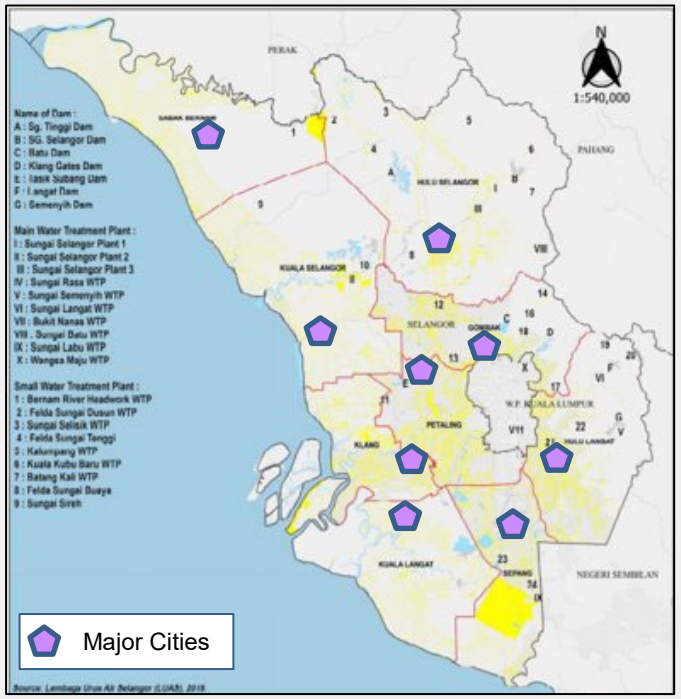


Figure 24: Proposed location of Drinkable Tap Water (Source: Draft Local Plan Kuala Selangor 2035)

Project Component

- Intelligent Aqua
- Rejuvenation Pipping System
- Materials for ductile iron/polyethene pipping
- Water purification and treatment

Figure 25: Illustration of Selangor Solar Farm

PROJECT 13: SMART-INFRA SELANGOR

Smart Infra Selangor project focuses on improving the service utility infrastructure such as internet coverage and solving the issues of interruptions in electricity supply, telephone connectivity, and leakages of pipes. Through this project, the internet coverage throughout Selangor can be ensured at high-speed, and any damage to the underground cables can be detected. The impact of the project includes connecting the community through a seamless digital lifestyle, better maintenance and inspection: and being able to reduce utility damage due to blind digging, soil settlement and corrosion.

Issue

- Selangor has reported poor internet coverage several districts.
- Often, unplanned disruption of utilities occurred due to lack of maintenance.

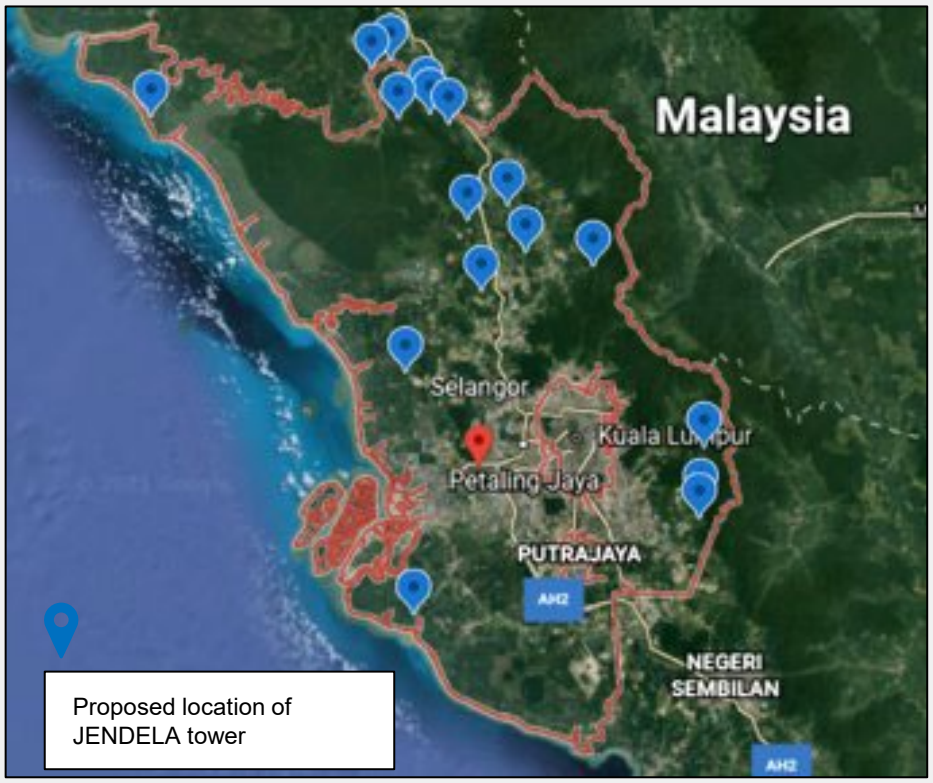


Figure 26: Coverage of Smart-Infra Selangor Projects (Source: Draft Local Plan Kuala Selangor 2035)

Project Component

- JENDELA installation
- 5G High speed internet coverage
- Tunnel of Command and Utilities
- Centralised utilities; power cables, water pipes, gas pipes, etc.

Figure 27: Project Components of Smart-Infra Selangor Project

CONCLUSION

In conclusion, as stated in Act 172 of Town and Country Planning, the provision of a State Structure Plan is important. The Selangor State Structure Plan 2035 was prepared and gazetted in 2017. The structure plan was reviewed to cater for the rapid development in Selangor in recent years. Selangor state is the main contributor to Malaysia's GDP and is at the hub or frontier of the new technological advancement in the country. The Draft Local Plan of Kuala Selangor 2035 is prepared by following the process from the inception report and then the technical report. The goals, objectives, thrusts, policies, strategies, and proposals were derived from the data, findings, issues, and prospects that were collected and analysed from Selangor. The goal of the state was to empower Selangor state as a resilient and competent global extent by 2035. In realising this goal, several high-impact projects on the economic, social, environmental, and infrastructure were proposed as part of this Draft State Structure Plan 2035. The proposed Polycentric Development Concept is deemed appropriate for Selangor State's strategic and geographical location to the sea, local resources, and Malaysia's capital city.

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