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The Penang Transport Master Plan (PTMP):

From a public transport plan to a developer's plan

INTRODUCTION

Penang Forum initially mooted the idea for a public transport plan, now known as PTMP, to the Penang state government in 2008. Promoting an evidence-based policy making approach to transport planning, Penang Forum assisted the state government in engaging the international Halcrow consultancy and facilitated the consultant's work. After months of data collection and public consultations, Halcrow drew up Recommended Transport Master Plan Strategy ('Halcrow Plan') featuring an extensive network of trams and BRT, the public transport component estimated to cost below RM10bn.

When the plan was nearly finalized, Halcrow was pressured to include Ewein's Zenith–BUCG sea tunnel and 3 major highways on the island costing RM6.3 billion. The Halcrow Plan, with a projected total cost of RM27 billion, was officially endorsed by the Penang state government in May 2013.

Lacking technical resources, the state government decided to appoint a project delivery partner (PDP) to implement the Halcrow Plan. This was done through a Request for Proposal. The winning bid was submitted by SRS Consortium, whose

proposal introduced new elements such as LRT, monorails and highways, departing from the Halcrow Plan in significant ways. Initially pitched at RM27 billion, the SRS plan quickly ballooned to RM46 billion, a whopping 70% increase in project costs.

The South Reclamation Scheme (SRS) Consortium consists of Gamuda, and two Penang developers – Ideal Property and Loh Poh Yen Holdings. In the role of the Project Development Partner (PDP), SRS would undertake to manage the construction of transport infrastructure and the reclamation of 3 artificial islands for timely delivery. The state government would finance the reclamation and sell the reclaimed land, zoned for industrial and residential development, in order to finance the PTMP. Phase 1 of the SRS PTMP, costing RM17 billion, involves

a) reclamation of two islands, totalling 3,496 acres (1,415 ha)
b) building one stretch of LRT from KOMTAR–Bayan Lepas, and
c) building the Pan-Island Link 1, Gurney Drive–Bayan Lepas.

Phase 1 of PTMP

PROJECT	SIZE	STATUS	COMPANY
North Coastal Paired Road from Tg Bungah to Teluk Bahang	10.53km	EIA approved, payment made for detailed design and feasibility study	**Zenith** (formerly Zenith–BUCG Consortium) *(SPV)*
Pan-Island Link 1 (PIL1) Expressway	19.5 km, incuding 10.1 km hill tunnel	EIA pending, 2018	**SRS Consortium** (*PDP*) Note: SRS will start with LRT and PIL1 as soon as Penang State Government signs the agreement – upon Penang government obtaining RM1 billion bridging loan OR approval of reclamation EIA.
KOMTAR–Bayan Lepas LRT	22km, 19 stations	EIA status?	
South Island A (Phase 1)	2298.08 acres (930 ha)	EIA approval not obtained, 2017 Note: Total reclaimed land in Phase 1 (A&B) is 3496.54 acres (1415 ha)	
South Island B (Phase 1)	1198.46 acres (485 ha)		

Table !: Phase 1 of the Penang Transport Master Plan, by SRS Consortium

WHY THE SRS PTMP SHOULD BE REVIEWED

The SRS proposed Penang Transport Master Plan (PTMP) is a massive infrastructure project with many components. The state government has presented the SRS plan as *fait accompli* with little real deliberation within the appointed Penang Transport Council. The 21 large volumes of the SRS PTMP were put on public display over the busy Chinese New Year period of 2017, under highly restricted viewing conditions. The vast majority of the over 100 public consultations were general briefings, with discussions over localized issues. Out of the many issues which remain unaddressed, here are 5 key reasons to review the SRS PTMP.

REASON 1: After the 14th General Elections in Malaysia, the political landscape has changed. The sea tunnel project was purportedly conceived because the former BN federal government would never allow the Penang state government to take over the ferry or build a third bridge. This rationale no longer holds. Halcrow found that cross channel traffic was only 7% of total traffic during peak hours. The second bridge is still underutilized. When pressured to propose a sea tunnel, Halcrow suggested that it might only be needed in 2030 (if at all), but state government made it a priority.

Another excuse was that with the Malaysian Land Public Transport Commission (SPAD) formerly under the BN, the state government had no control over public transport planning and its routes. Now that the new government is in power, the priority should be to improve public transport, not make new highways.

REASON 2: In 2016, the Penang state government issued a letter of offer to SRS, with the stipulation that no compensation would be paid if approvals were not obtained or either party decided to walk away. A timely review would save Penang a lot of money. Major transport projects such as the KL–Singapore High Speed Rail (HSR) and the East Coast Rail Link (ECRL) are in the process of being reviewed by the federal government, why not the PTMP ?

REASON 3: The SRS PTMP projects are not financially prudent and will burden state finances for years to come. The two Phase 1 projects are examined here:

a) The proposed Pan-Island Link 1 will be a 6-lane highway over the hills, 19.5 km long. It involves drilling and blasting a pair of hill tunnels (3 lanes per tunnel) through the Penang hills, in several stretches totaling 10.1 km. Estimated to cost RM8 billion, with no provision for maintenance costs, it might be one of the most expensive highway ever built in Malaysia, at RM410.25 million per km. In addition to financial costs, the PIL1 will incur incalculable social and environmental costs. The highway, its interchanges and feeder roads will affect or "seriously affect" at least 9 schools, 10 houses of worship 2 of Penang's most popular public recreational parks (the Penang City Park/Youth Park and Sungai Ara Linear Park), and many homes and private premises. Just as importantly, the PIL 1 is likely to undermine the public transport strategy as the availability of the toll-free PIL expressway wrestle away the modal share and ridership of the proposed LRT, which operates in a similar north–south corridor.

b) The proposed KOMTAR–Bayan Lepas LRT is 22 km long with 19 stations.

- Estimated costs were revised from RM6bn to RM7bn to RM8.4bn in one year.
- The construction costs of LRT per km is 3 times that of modern tram, and 4 that times of BRT per kilometre.
- The annual Operating & Maintenance (O&M) costs of LRT is between 3 to 6 times that of tram.
- Assuming ridership of 8 million per year at RM4.00 per trip**, the LRT will burden the state government with a RM138 million deficit per year, compared to a projected surplus of RM10 million for tram**
- Assuming a ridership of 5 million, the annual LRT deficit will rise to RM150 million, compared with RM 2 million for tram.
- With an annual total state budget of about RM1 billion, or an annual state revenue of just RM687 million in 2017, can the state government afford to sustain an annual deficit of RM138 million on one line? Why has the state not done a comparative financial analysis of alternative approaches? Why are cheaper alternatives not considered?

- The totally unrealistic projected ridership of 42 million per year for the LRT is partially based on a population projection which is not supported by the Department of Statistics data. Without sufficient ticket revenue, the heavy operation and maintenance costs of LRT will result in unsustainable deficits.

KOMTAR to Airport (17 km)	LRT*	Tram**	BRT**
Construction cost RM million per km	RM 220m	RM50m (at grade) RM 80m elevated	At grade RM 25m Elevated RM 50m
Annual O & M	RM 170m	RM 22m	Not available
Projected ridership per year	8 million	8 million	NA
Projected ticket revenue (RM 4.00/trip)	RM 32m	RM 32m	NA
Surplus (Deficit)	(RM 138m)	RM 10m	NA
Carrying Capacity (PPHPD = person per hour per direction)	18,500	7,000 to 20,000	NA

Source: Costs figures for LRT from SRS PTMP report; costs figures for tram and BRT from Halcrow Report Vol. 2, tables 5.1 and 11.5

Table 2: Comparative costs and revenue of LRT, ModernTram, BRT

c) Funding mega projects with revenue from reclamation is financially risky to the State as there is a cash flow mismatch between payment for construction and expected revenue from sale of reclaimed land. Poor market conditions can lead to shortfall in expected revenue interrupting or derailing the projects. The property market is likely to overhang when the reclamation of STP2 (760 acres) and Gurney Wharf (131 acres), currently being undertaken, are completed in the next few years. The bridge loan financing of RM 1 billion to RM2 billion is inadequate for the RM17 billion Phase I of the PTMP.

REASON 4: The SRS plan is a developer's plan, and is not designed to achieve a 40% public transport mode share by 2030, as per the state's avowed objectives.

- The huge financial and environmental costs of PIL1 appears to advantage property values in the south of Penang island, in particular the future 3 islands, instead of

"moving people not cars". This sort of 'property play' financed with public money is totally unjustifiable.

- What is needed is a public transport network serving the people in high-density low-income housing areas who are likely to depend on public transport. The PIL1 through hill tunnels is sub-optimal for traffic diversion, and the expensive LRT will be difficult to expand in an integrated manner.
- The use of different elevated transport modes such as LRT and monorail will prove expensive and difficult to integrate. As the number of different public transport systems and rolling stock types increase, the increasing complexity of the system may lead to 15–20% higher maintenance costs.
- While elevated stations might be necessary in some areas, they are not preferred due to potential problems of access by OKU, expensive land acquisition or lost opportunity costs.
- In the face of rapid technological advancement in transport, the rationale given for a RM46 billion PTMP – that it will serve Penang for the next 50 years – is simply indefensible.
- The design of the project is such that after 5 years, there might be only 1 stand-alone LRT line instead of public transport network.

REASON 5: The negative impacts of the SRS PTMP may undermine the international competitiveness of Penang's tourism industry and its livability index.

- The massive elevated roads over the slip-prone hills will adversely affect the environment.
- The elevated LRT lines, monorail lines, stations and car parks will be a blight on Penang's heritage sites and scenic coastline.
- The bulky elevated transport hub at Siaboey/Prangin canal will mar the vista and tertiary zone of George Town World Heritage Site.

THE WAY FORWARD

The Penang state government just approved RM17 billion for Phase 1 of the SRS PTMP even though our state expenditure is less than RM1 billion per year. It is urgent to:

1. Review the SRS plan and Ewein–Zenith sea tunnel and 3 highways.
2. Decouple the SRS PTMP and land reclamation. Any land reclamation proposal needs proper planning and a Detailed Environmental Impact Assessment (DEIA).
3. Scrap the Ewein–Zenith sea tunnel and at least 2 of the 3 highways; use the RM6.3 billion to fund the implementation of a better, cheaper, faster version of the PTMP.
4. Revisit the Halcrow plan and develop a new PTMP. Use public transport to deliver equitable, sustainable development, with mobility and connectivity provided by extensive network of BRTs and trams. Prioritise a **cross-channel public transport link**. Reinvest in the Penang ferry and expand water transport with multiple passenger ferry piers, like San Francisco, and link to public transport, like Hong Kong. The new PTMP should plan for new Transit-Oriented Development (TOD) urban nodes, help revitalise rural coastal nodes, and create new jobs.

5. Engage independent international bodies to review the SRS Penang Transport Master Plan to see if it is indeed designed to achieve a 40% public transport mode share by 2030, as per the state's avowed objectives. The Halcrow PTMP strategy and the SRS PTMP should be compared, and the Request for Proposal (RFP) process should be revisited. The SRS PTMP should also be examined in the light of changing trends in smart mobility and concerns about climate change.

6. Make the PTMP fully transparent and available online, to facilitate greater public awareness and wider feedback. Commit to genuine stakeholder engagement to come up with a sustainable transport that has minimal social and environmental impact.

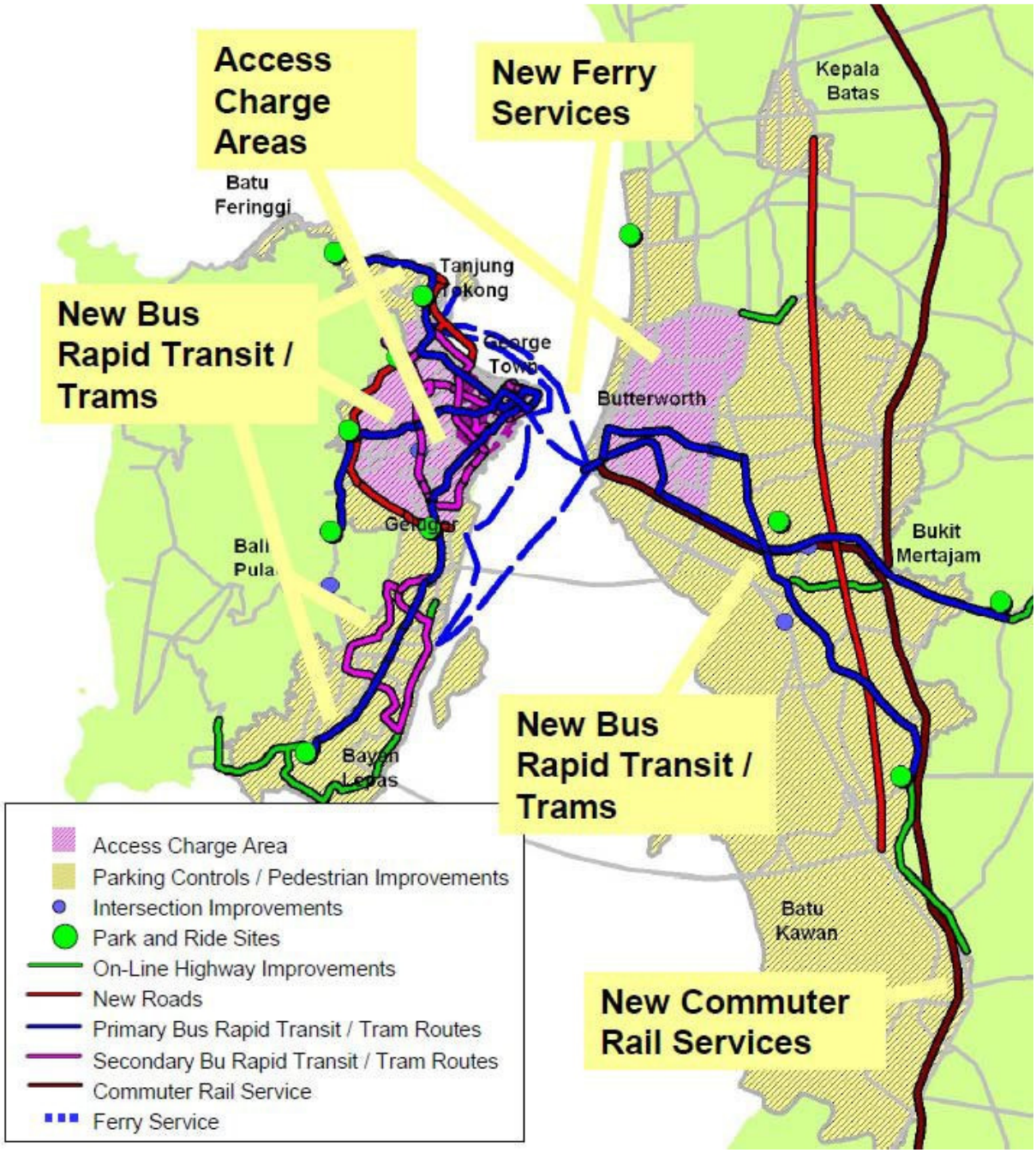


Figure 1: Integrated sustainable transport plan, Halcrow Report, 2013

THE RECOMMENDED TRANSPORT MASTER PLAN STRATEGY (HALCROW, 2013)
Public Transport Network Improvements - Summary of Costs

Item	RM Millions
Infrastructure Costs - Tram Routes	
George Town - North Coast Line	532
George Town - Air Hitam Line	720
George Town - Airport Line	1,171
Macalister Line	160
CAT Line	244
Times Square Loop Line	256
George Town Orbital Loop Line	1,348
Infrastructure Costs - Bus Rapid Transit Routes	
Bayan Lepas Orbital Loop Line	867
Butterworth - Bukit Mertajam Line	655
Mainland Southern Corridor Line	945
Infrastructure Costs - Other Public Transport Routes	
Commuter Rail Services	20
New Ferry Services	355
Infrastructure Costs - Park and Ride Sites	
Primary Sites	140
Secondary Sites	60
Vehicle Fleet Costs	
Trams	650
BRT	50
Ferries	268
Commuter Trains	450
Buses	35
Depot, Maintenance and Storage Facility Costs	
Tram Fleet	350
Bus Rapid Transit Fleet	100
Commuter Rail Fleet	200
Ferry Fleet	100
Total (RM Millions)	**9,677**

Table 3: The Recommended Transport Master Plan Strategy: Public Transport Network Improvements, Summary of Costs, by Halcrow Consultancy (the "Halcrow Plan").

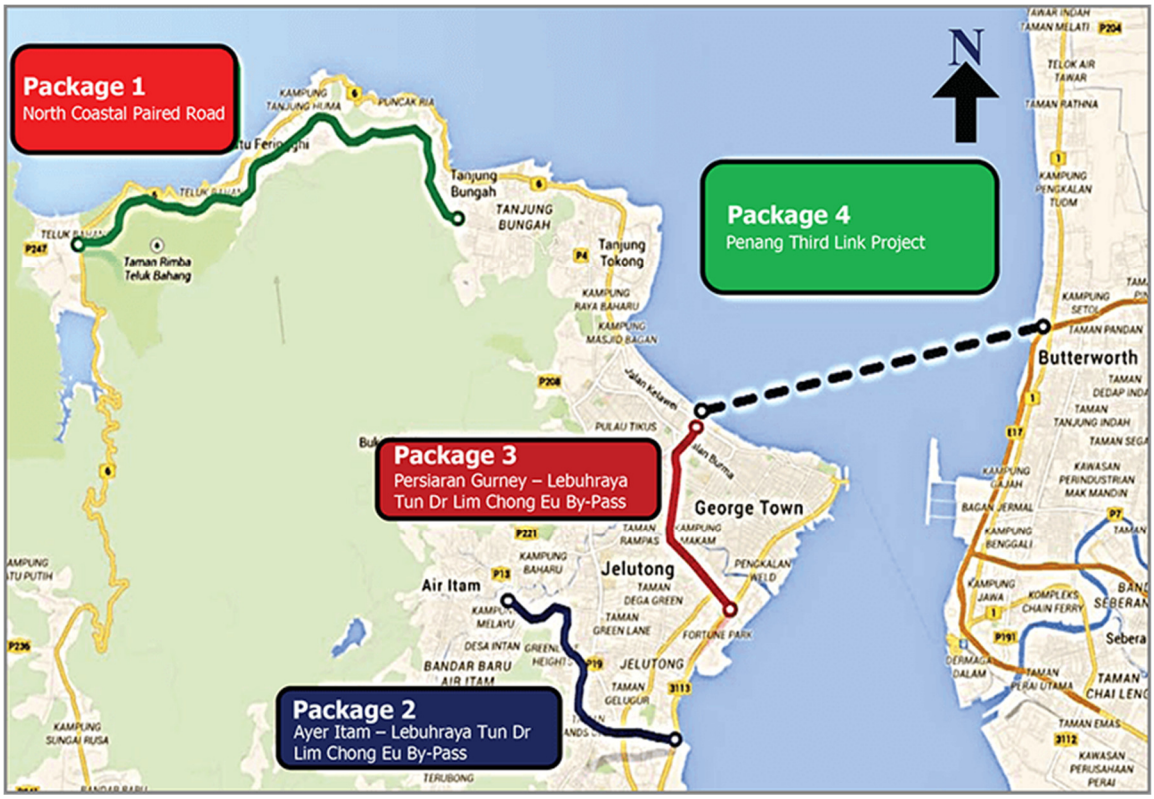


Figure 2: Plan of proposed sea tunnel and 3 highways, to be undertaken by Zenith–BUCG

Payment to Zenith for Tunnel and 3 Highways

Tunnel + 3 roads = RM 6.3 billion, total FSDD RM305.002m
Total land from STP2 and Gurney Wharf to be swapped: **110 acres.**
So far transferred 2 plots worth RM208m, as payment for
Feasibility Study and Detailed Design **(FSDD) to be completed April 2016**

(a) Three major roads project
- 10.53km North Coastal Paired Road from Tg Bungah to Teluk Bahang
- 5.7km Air Itam to LCE Expressway bypass
- 4.075km Gurney Drive to LCE Expressway bypass

FSDD (completed?): RM31.269 m + RM177.485 m = RM208.754 m

(b) Undersea tunnel project
7.2km undersea tunnel connecting Persiaran Gurney to Bagan Ajam
FSDD ("92% completed"): RM20 m + RM76.248 m = RM96.248 million

Source: 'Penang exco man breaks down costs for undersea tunnel, roads' FMT Jan 14, 2018
KINIGUIDE: Understanding the Penang undersea tunnel project, 24 Jan 2018

Table 4: Payment for Sea Tunnel and 3 Highways, compiled by Penang Forum

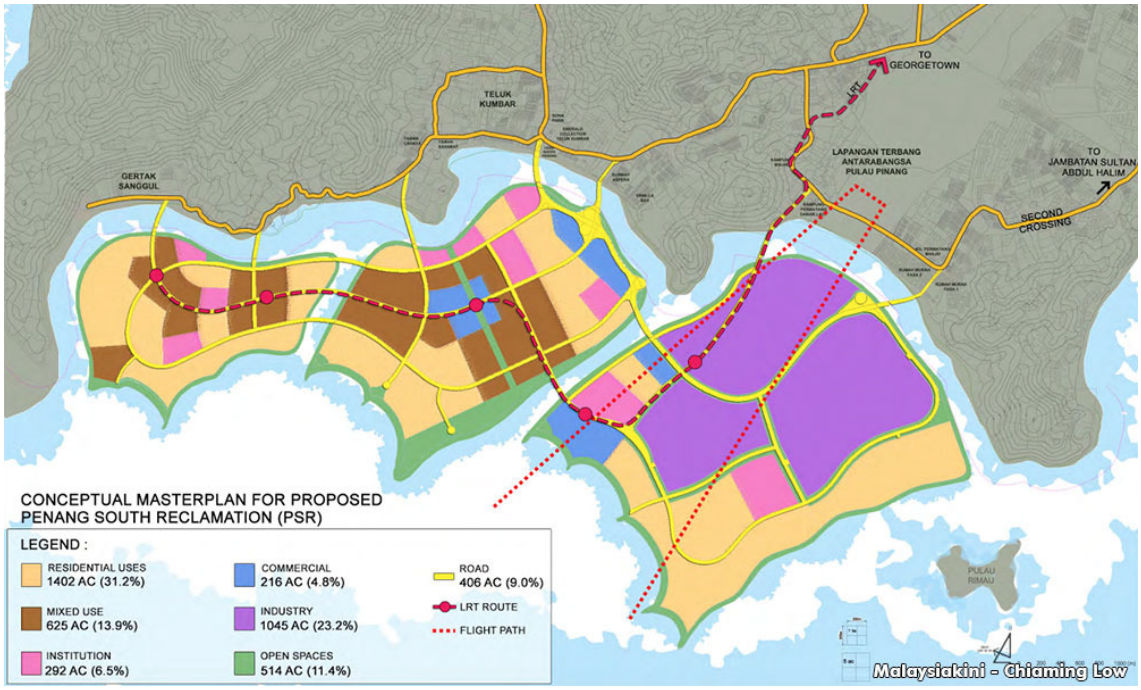
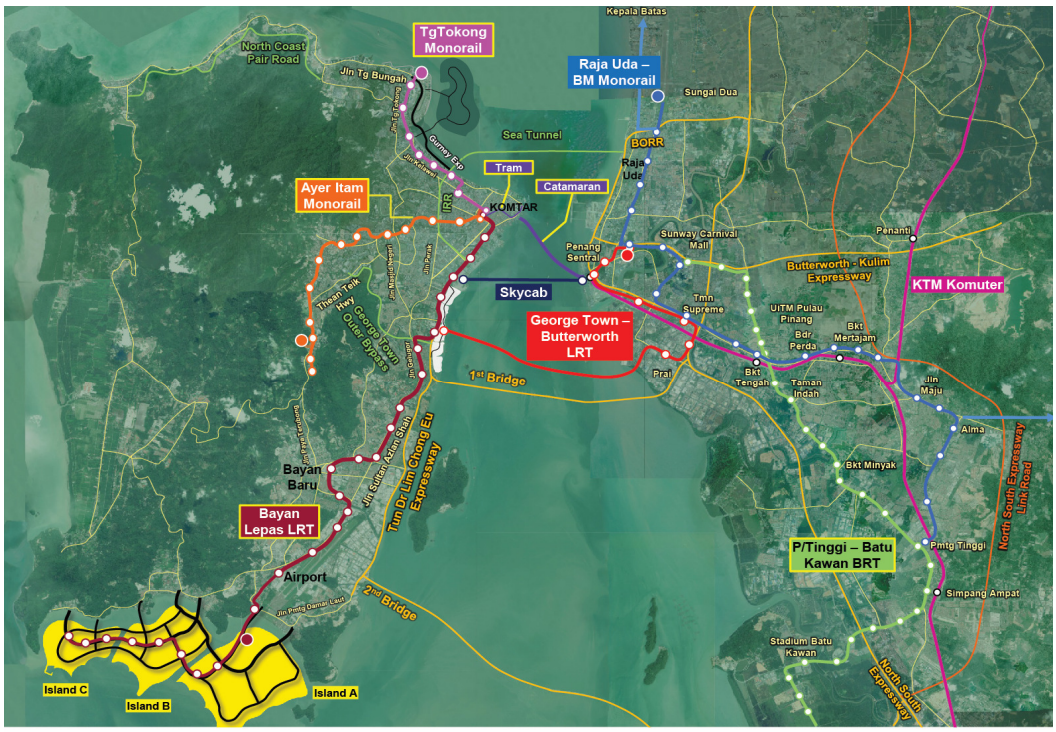


Figure 3: Plan of proposed 3 reclaimed islands, to be undertaken by SRS consortium

Land Reclamation Projects

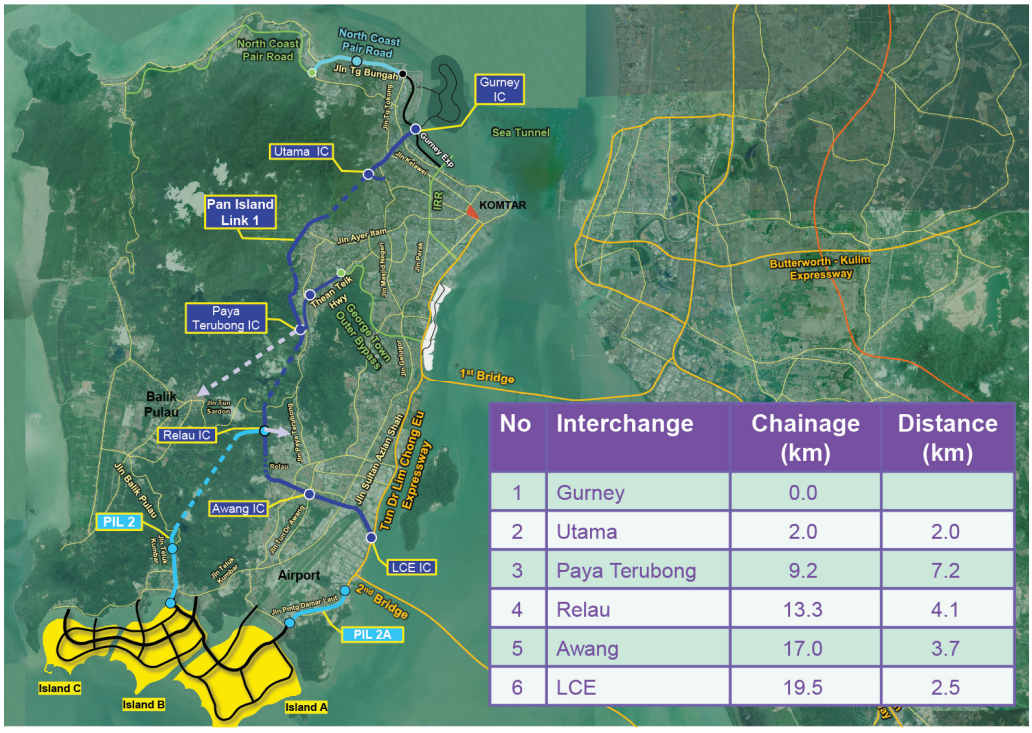
PROJECT	SIZE	COMPANY	REMARKS
Sri Tanjung Pinang 1 (completed 2005)	240 acres	Tanjung Pinang Development	
Sri Tanjung Pinang 2 (commenced 2016)	760 acres	Tanjung Pinang Development	RM110 per sq ft (The Edge, 30 Oct 2015)
Gurney Wharf	131 acres	Tanjung Pinang Development (to be paid by Penang State Government)	
South Island A (Phase 1)	2298.08 acres (930 ha)	SRS Consortium (PDP)	Total reclaimed land in Phase 1 (A&B) is 3496.54 acres (1415 ha)
South Island B (Phase 1)	1198.46 acres (485 ha)	SRS Consortium (PDP)	
South Island C (Future)	798.15 acres (323 ha)	SRS Consortium (PDP)	Total reclamation for 3 islands (A,B,C) is 4294.69 acres (930 ha)

Table 5: Comparison of some recent and proposed land reclamation projects around Penang island, compiled by Penang Forum



Note: Transit alignment & system subject to review prior to implementation

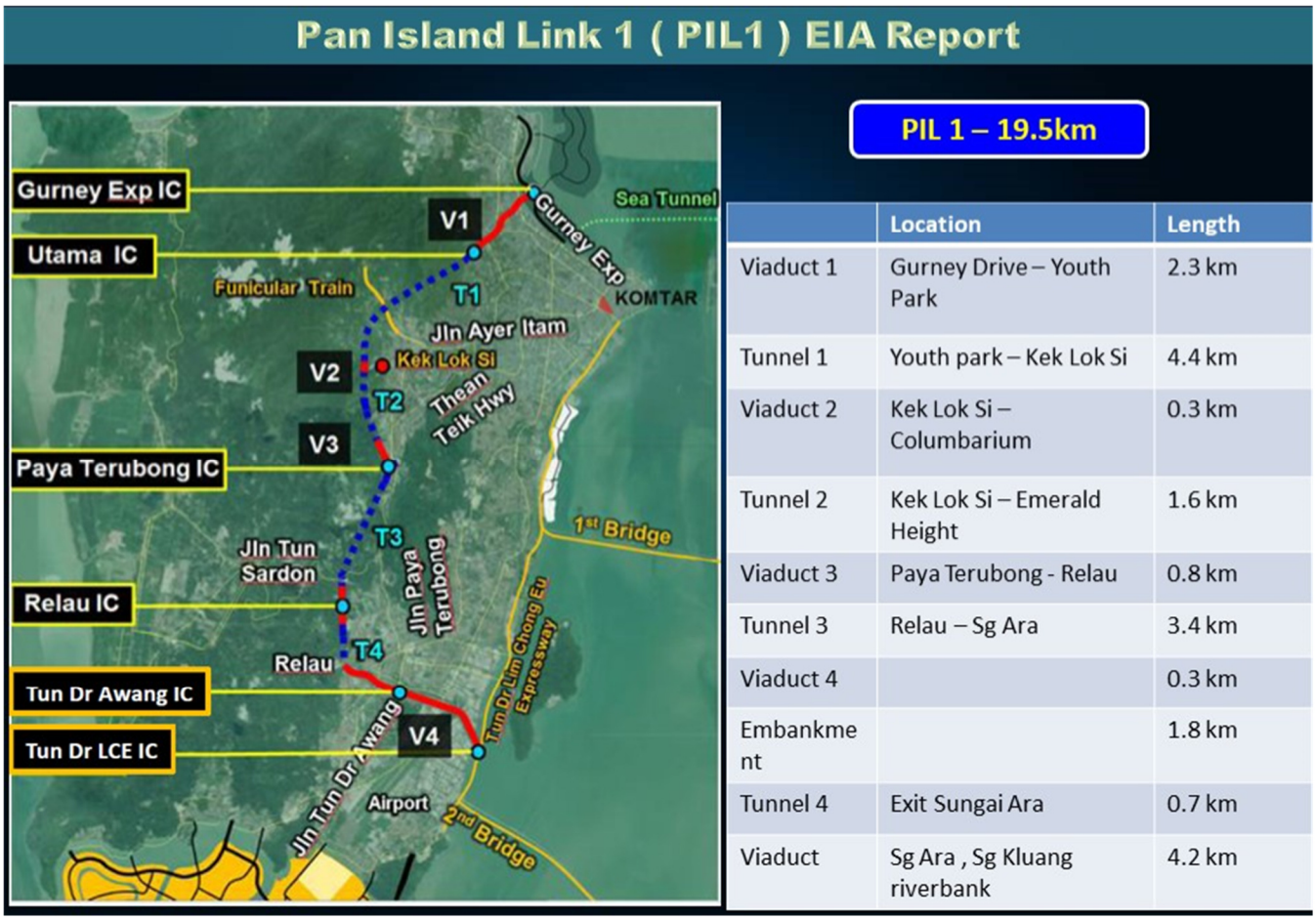
Figure 4: Public transport components of Penang Transport Master Plan, by SRS Consortium



No	Interchange	Chainage (km)	Distance (km)
1	Gurney	0.0	
2	Utama	2.0	2.0
3	Paya Terubong	9.2	7.2
4	Relau	13.3	4.1
5	Awang	17.0	3.7
6	LCE	19.5	2.5

Note: Gurney IC will be built by appointed parties. Relau IC will be built as part of future PIL2

Figure 5: Highway components of the PTMP, by SRS Consortium. Phase 1 PIL 1 will be built over the Penang Hills, with negative socio-environmental and scenic impacts.



	Location	Length
Viaduct 1	Gurney Drive – Youth Park	2.3 km
Tunnel 1	Youth park – Kek Lok Si	4.4 km
Viaduct 2	Kek Lok Si – Columbarium	0.3 km
Tunnel 2	Kek Lok Si – Emerald Height	1.6 km
Viaduct 3	Paya Terubong - Relau	0.8 km
Tunnel 3	Relau – Sg Ara	3.4 km
Viaduct 4		0.3 km
Embankment		1.8 km
Tunnel 4	Exit Sungai Ara	0.7 km
Viaduct	Sg Ara , Sg Kluang riverbank	4.2 km

Figure 6: Pan-Island Link expressway as shown in EIA report, July 2018, by SRS Consortium. 19.5 km highway with 10.1 km hill tunnel in four sections.

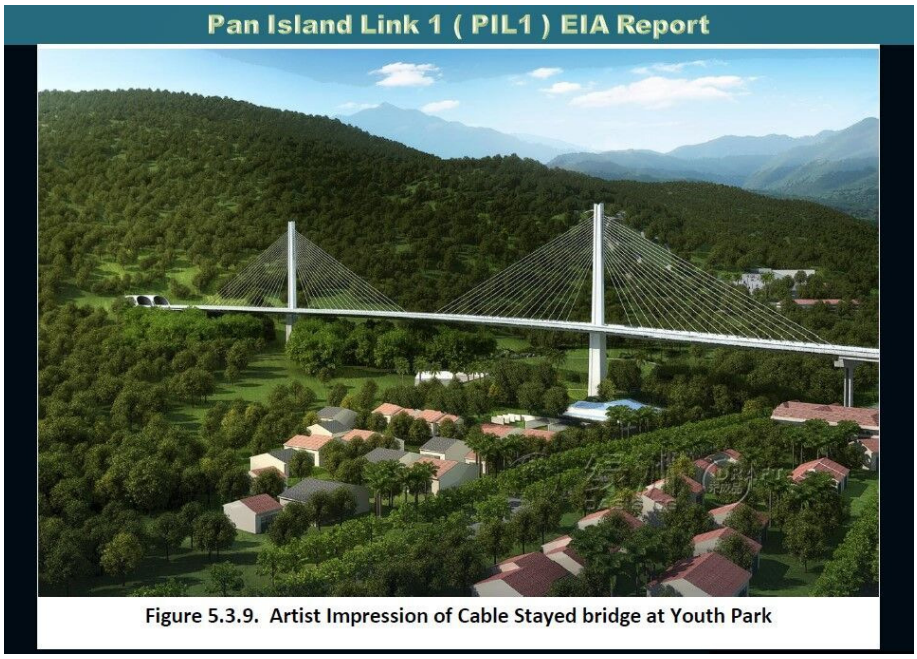


Figure 7: Proposed bridge spanning 500 metres over The Penang City Park (Youth Park)

Note: Transit alignment & system subject to review prior to implementation

Figure 8: Proposed PTMP Transport Hub, by SRS Consortium. Elevated structures will mar vista and tertiary zone of George Town World Heritage Site.

Note :Lembah Permai, STP and Gurney ICs will be built by appointed parties

Figure 9: Proposed elevated Tanjung Tokong Coastal Road, leading to the Phase 1 North Coast Paired Road, estimated cost of RM1 billion for 10.53 km (including land acquisition costs), with negative impacts on coastal scenery and eroded granite hills.

Penang Transport Master Plan (PTMP)

PROJECT	LENGTH	COMPANY	COST
Public Transport 1. Bayan Lepas LRT [KOMTAR – Bayan Lepas] [Future: KOMTAR – reclaimed islands 30km/27 Stns] 2. Ayer Itam Monorail 3. Tanjung Tokong Monorail 4. Raja Uda – Sg Nyiur – BM – Permatang Tinggi – Monorail [Potential BRT extensions] 5. Tram [6. George Town – Butterworth – Sungai Nyiur LRT]	22km/19 Stns 30km/27 Stns 13km/13 Stns 7km/8 Stns 28km/21 Stns 2km/6 Stns 18km/8 Stns	**SRS Consortium** *Project Delivery Partner (PDP)*	**RM46B** inclusive of reclamation of 3 islands
Highways 1. Pan Island Link 1 2a. Pan Island Link 2 2b. Pan Island Link 2A	19.5km/6 IC 8km/2 Stns 3km/2 Stns	**SRS Consortium** *(PDP)*	
Roads 1. North Coast Pair Road (NCPR) [Jln Lembah Permai, Jln Tg Bungah – Jln Tg Tokong]	4km/1 Stn	**SRS Consortium** *(PDP)*	
Interchange (IC) 1. Butterworth – Kulim Expressway (BKE IC) 2. Juru IC	N.A. N.A.	**SRS Consortium** *(PDP)*	
Missing Links and Road Upgrading 1. Permatang Pasir – PERDA 2. Bukit Minyak	7km 2km	**SRS Consortium** *(PDP)*	
BRT 1. Pmtg Tinggi – Batu Kawan line – Ext N to Bukit Tengah/Seberang Jaya – Ext S to Nibong Tebal 2. [Potential BRT Ext N Raja Uda – Kepala Batas] 3. [Potential BRT Ext E Alma towards Kulim]	14km/15 Stns 13km/10 Stns N.A.	**SRS Consortium** *(PDP)*	
Penang Undersea Tunnel 1. Phase 1a 2. Phase 1b 3. Phase 2 4. Phase 3	7.2km	**Zenith–BUCG Consortium** *(SPV)*	**RM6.34B** Payment in the form of 110 ha STP2 and Gurney reclamation land
[Roads*] [1. NCPR, Tg Bungah to Teluk Bahang] [2. Air Itam to LCE Expressway bypass] [3. Gurney Drive to LCE Expressway bypass]	10.53km 5.7km 4.075km	**Zenith–BUCG Consortium** *(SPV)*]	
[Penang] Sky Cab [Penang Sentral, Butterworth – Middle Bank – Gat Lebuh Noordin, Penang Island*]	3 km	**MRCB**	

Source: Table reproduced in http://pgmasterplan.penang.gov.my/index.php/en/2016–02–26–03–12–57
[in square brackets = elsewhere in PTMP website] [in square brackets* = added from other sources]

Table 6: Components of the Penang Transport Master Plan by SRS, Zenith and MRCB, compiled by Penang Forum.