The boat as main mode of transport, Western Islands of Batam

Belakang Padang port, Batam

New international ferry terminal in Puteri Harbour, Johor Bahru

Changi point ferry terminal, Singapore

Architecture of Territory
ETH Zurich
FCL Future Cities Laboratory

Sea Region
Singapore, Indonesia, Malaysia
Project 2

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SEA TRANSPORT

Passenger Mobility in the Sea Region

by
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Public Ferry and Boat Connections

Historically, most settlements in the region of Singapore, Johor and Riau Archipelago were placed along the coasts and oriented toward the sea; the sea transport was the sole means of movement among the coastal communities up to the modern era. The maritime passage through the Archipelago and the Straits shaped the distinct and diverse ethnic, religious and cultural character of the region.

After the dramatic political shifts of the 1960s, precipitated by Singapore's independence from Malaysia, the national maritime borders were introduced, cutting through the formerly unified territory. Restrictive measures on border crossing and highly secured checkpoints reshaped the habits and the patterns of the people's daily movements. While passenger mobility between the Riau Archipelago and Singapore remains sea-based and still relatively underdeveloped, the massive land-based transport links between Singapore and Johor have completely replaced the older boat and the rail connections. Other signs of the shift from the maritime to the land-based urban culture in the region include the disappearance of coastal kampungs, the large-scale industrial and security zoning of the coastline, and the gradual loss of the public access to the sea and the coast.

This project promotes the increasing public access to the sea, and the establishing of a dense and diverse network of cross-border sea transport among the three countries. Aiming to improve the existing rigid and directional system, the project proposes new models of sea transport that would increase the appeal and the quality of life in the cross-border metropolis. The project consists of four main strategies: a new network of fast ferry connections and multi-modal terminals, a small-scale water-bus routes, new connections over the Johor Strait, and a hop-on-hop-off routes in the areas where the central and the residential urban fabric touches the coastline.

The project also aims to recapture the character of an open maritime space of the Straits of Singapore and Johor and to rebuild some of the region's historical and cultural connections. The sea transport network should be seen as part of the cultural heritage of the region and the cross-border metropolis.

The Narrative of Crossing Borders

Using transport in the SIJORI region always involves crossing a national border. Travelling from Singapore to Johor Bahru and the Riau Archipelago, we experienced how difficult and time consuming these relatively short trips can be. Travelling within the region has changed significantly throughout the last two centuries. The shift from a relatively borderless, unified territory to three separate nation-states greatly impacted the movement of people and goods; Singapore in particular has enclosed itself within highly secured borders. Through the process of state formation, travelling across the region became more formal: the necessity of visas made border crossing more complicated, more expensive, and almost unaffordable for the daily work migrants going from Johor to Singapore and back. With the introduction of the Indonesia-Malaysia-Singapore Growth Triangle (IMS GT), cross-border exchanges increased, especially for commercial passenger and cargo traffic. The formerly strong cultural and social ties among coastal communities have nearly disappeared in the wake of three separate states focused on their own economic and social growth.

A Short Journey, a Long Trip

The easiest way to find out how sea transportation really works in the region is to take the ferry to Batam, Indonesia. Only 18 kilometres from Singapore, the island plays an important economic role in the region.

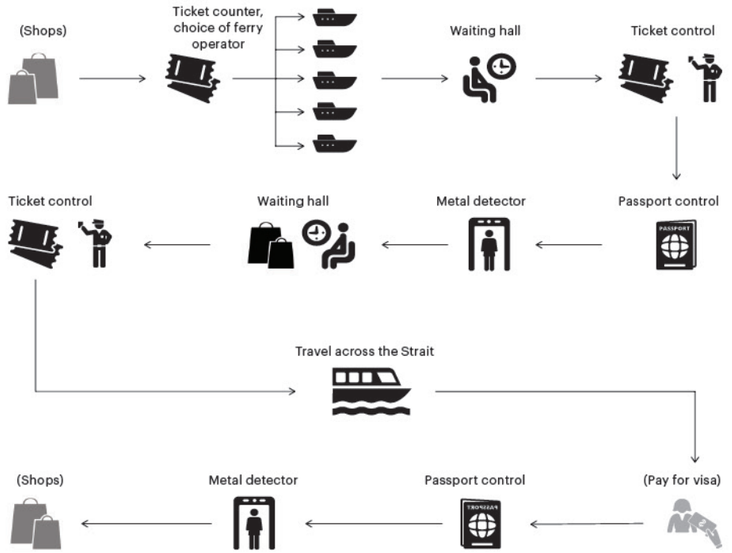
The short distance implies that the ferry crossing is short and simple. On the contrary, it is not. The entire process of entering the ferry terminal, rushing through its huge shopping mall, clearing immigration and security was more involved than we anticipated. Exactly the same procedure took place on the other side. Surprisingly, the shortest part of the journey is the ferry ride itself. Rather than the estimated 45 minutes, it took over two hours.

Border crossings at the Causeway and Second Link, Singapore's only connections to Malaysia, are just as tedious. Both countries have built enormous infrastructures on either side of the massive Causeway dam and Second Link bridge. Passengers must walk hundreds of meters through these massive buildings to pass immigration and security.

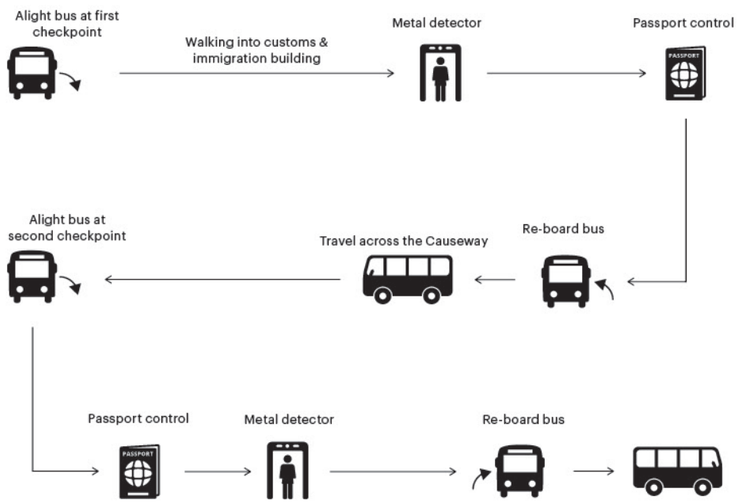
In the following chapter we explore the reasoning behind these absurd phenomena by analysing the history of the region's politics and national borders.

Strait of Singapore -
Indonesia, Singapore, Malaysia
The image shows the Singapore Causeway Terminal in Woodlands. For a building designed to accommodate the border crossing procedure, it is enormous.

In both cases - travelling by causeway to Malaysia or by ferry to Indonesia - a full body scan is performed.



Crossing the "Maritime" Border
Crossing the Strait of Singapore by boat does not differ much from taking an international flight. The procedure is similar in terms of effort to go through immigration and the boarding of he vessel.



Crossing the "Land" Border
In the specific case of the Causeway and the bridge of the Second Link, the travel experience by bus is dominated by hopping on and off buses while shuttle to the different security and immigration checks.

From Free to Restricted Mobility

Throughout its long and complex history, the SIJORI region has experienced multiple periods of development and the rise of new geopolitical entities. In pre-colonial times, powerful political centres and by loose boundaries characterized the Malay world. During the colonial age, the Dutch and English empires divided this world under their own spheres of influence, forming the territorial basis for what would become modern-day Indonesia, Malaysia, and Singapore.

Each of these periods can be distinguished by distinct and overlapping patterns of human mobility. Historically, the region relied entirely on the maritime connections; people moved freely over water, trading within the region and the rest of the world by sea. As colonies, lands gained importance for their resources and agricultural production. The efficiency in the transport of goods towards Europe or the other colonies was an important factor for the development of the inland transport network, but the main connections and trade routes remained sea-based.

In more recent history, sea transformed from connection to border. The sea's identity as common resource and a central, interactive space, was dramatically reduced by the introduction of political borders. After the 1963-66 Indonesian-Malaysian Confrontation of and shortly after Singapore gained independence, the sea became a zone physically demarcated by control boats, during which new grounds were set for establishing sovereignty.

The multiple realities reunited under the sign of the Indonesia-Malaysia-Singapore Growth Triangle indicated the shared will to re-introduce a fluidity across the maritime borders, but mostly to the exchange and transport of goods. The cross-border movement of passengers remains a sensitive issue, and immigration control is central to international political and economical negotiations.

A view of Singapore from the Sea, Jacob Jansen, 1838

Petrus Plancius Map, 1594

Before 1800: A Maritime World

Before the arrival of the British in Singapore, the region was maritime-based. The early settlements were built on islands, along the seacoast or riverbank, leaving the rest of the territory covered by dense tropical forest. These skilled maritime people had a great geographical advantage, as ships on the international trade routes between China and Europe passed through the Straits. The pattern of the seasonal monsoon made the region's calm waters a safe place to stop.

Only after the development of long-range, east-west trade were distinct political units created. The traditional Malay states were always fragile entities, because their control relied on the sea routes. The courts strung from island to island, from one riverbank to the other, remaining extremely vulnerable to changes affecting the international trade routes. Any decline in trade had a consequent effect on the political structure of the Malay states and could potentially lead to destruction.

1.
Extract of a map showing the Singapore and Johor railway line, 1912

2.
Wagon-ferry jetty at Johor Bahru, 1919

3.
Completed Causeway, 1924

1.

1824-1963: Development of Transport Infrastructure Singapore - Johor

The development and improvement of the connection between Singapore and the Malaya started with their growing political and economical association during colonial times, under the British East India Company.

Whereas Singapore soon turned into a port of regional importance, Malaya emerged as a major producer and exporter of raw materials. Goods were brought to the Singapore Port, and shipped throughout the world, an interdependency that only increased with time. For greater efficiency, a railway was built on both sides of the Strait, first connected by a ferry, and later linked by the Causeway.

2.

1919, Johor Strait Ferry

Before the Causeway was built, between 1907 and 1919, people and cargo were transported across the Johor Strait by ferry.

Because of the rising demand for cargo transport, so-called wagon ferries were introduced (image) in order to increase efficiency. Soon the ferry reached its limit, driving demand for more viable alternatives.

3.

1924, Johor Strait Causeway

Passengers could cross the new Causeway by rail, by automobile, and on foot. In addition to increasing cargo transport, personal transport grew to 30,000 people per day by 1953.

Top:
The Singapore Strait, 1950s

Bottom:
Market in Singapore, 1940s

1819-1963: Evolution of the Relations between Singapore and the Riau Archipelago

The history of maritime access between the Riau Islands and Singapore is one of growing and contracting borders. The signing of the Anglo-Dutch Treaty in London in 1824 introduced political borders to the region. A shared border zone between Singapore and the Riau Archipelago allowed people of common ethnic background free, unrestricted movement across the Strait.

The cultural and familial ties between Singaporeans and Riau Islanders concerned more than their social heritage; it was also important to their economic livelihood. Until 1963, the economy of the Riau Archipelago was more integrated with Singapore than it was with the rest of Indonesia. Movement across the Strait was perceived by the inhabitants of Riau as an way of life and a sign of shared economic advantages. Even after Indonesian independence and the subsequent creation of national borders, the islanders continued to sail freely to Singapore.

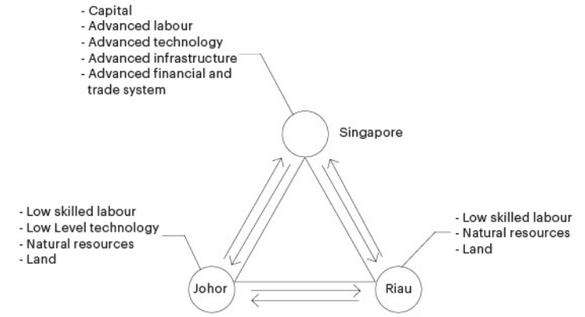
The Indonesian-Malaysian Confrontation of 1963-66 was the first geopolitical event to drastically restrict this regional mobility. The Riau Islanders suddenly found newly imposed national borders forbidding them from freely entering Singapore.

1967
Vehicles being checked on the first day of immigration control at the Woodlands Checkpoint

The Arising of Borders after Singapore's Independence

After Singapore gained independence, interaction with neighbours in the Riau Islands and Johor became significantly reduced. Despite the strong economical, social, historical and ethnical connections developed over centuries, each nation's citizenship and nationality suddenly took priority, leading to a breakdown in regional ties.

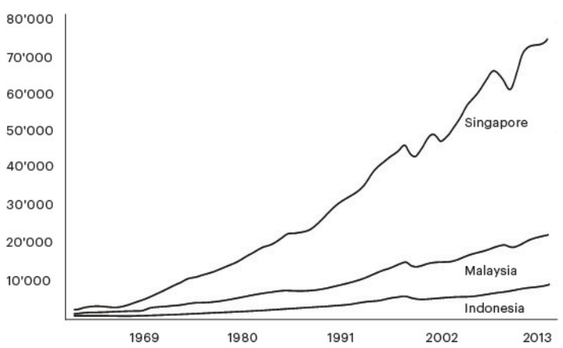
To compensate for its newfound sense of isolation, Singapore spent its early years strengthening its national identity. Border restrictions were slowly increased over time, but because of the varied economic and political development of the three nations, they eventually led to a complex political situation, particularly between Singapore and Malaysia.



Indonesia - Malaysia - Singapore Growth Triangle

In December 1989, Singapore's Deputy Prime minister Goh Chok Tong announced the Growth Triangle a new economic cross border regional development concept. It was intended to open opportunities for Singapore to address the competitive pressures of globalization by accessing cheap labour, land, and associated resources such as water and food in the Riau Islands and Johor. In addition, the agreement would attract investment to the region, making it more competitive with other regions in East and Southeast Asia.

However, the Growth Triangle and the implemented Special Economic Zones have not relaxed the tight customs and immigration controls for people trying to reach Singapore from Indonesia or Malaysia. For instance, workers from Batam and Bintan cannot move to Singapore as easily as other tourists or business people. Nor has the Growth Triangle made border relations with Johor any less complicated in terms of travel time and immigration processes, as shown on the following page.



Economical Development in the Border Triangle

The graph compares the GDP per capita of the three countries: Singapore, Malaysia and Indonesia. It shows the changing pace of economic development for the three countries after Singapore gained independence. The border became as restrictive in the economic as in the physical sense, creating greater financial disparities across the Straits.

A shop owner told us: "According to the stories of the old people in Tanjung Pinang they would go to Singapore just to clean their jackets, just to buy rice! ... Now it is the reverse. Singaporeans come to Indonesia to shop."

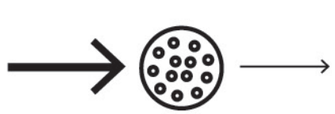
Checkpoint Border Permeability

Singapore has just eight border checkpoints. While the tight border may be easy to control, it is nevertheless a source of debate among the three nations.

The Complexity of Border Crossing

After the nature of the border changed in the last decades, the cross-border transport links acquired different levels of political significance between the nations on either side. In the specific case of the SIJORI region, it is essential to differentiate the borders between each nation.

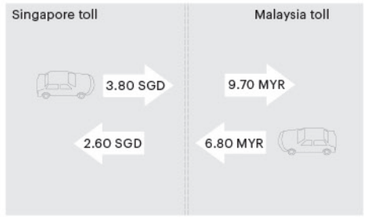
The distinction is especially visible in the material manifestation of customs and immigration facilities. In some cases there is a separation of transport infrastructure from border security, while in others transport links and checkpoints are united as part of the same procedure. Although the before mentioned examples are referring to the border between Singapore and Johor, some of the same concepts described here after Paul Barter (2006), could be applied to the maritime border with Riau.



"Filter"
Certain practices at the border are clearly made to encourage or discourage certain types of flow. This filtering role of the border can however also be observed on an economical level (toll), without considering the checkpoint hassle. The "filter" acts in both ways since the two countries have contrasting interests regarding goods traffic (as seen in the competition between ports) and private mobility (loss in tax revenues).

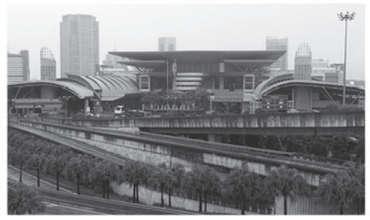
"Valve"
Very similar to the "filter" concept in terms of encouraging or discouraging flow, the "valve" tends to be more precise. In fact, it indicates that the filtering varies depending on the flow direction and on who is controlling the opening and closing of the "valve".

"Gateway"
This is an example of cross-border transport link playing a role that relates to sovereignty and territoriality. It is the physical, visible sign of one country claiming authority over its territory. The practical role of the checkpoint as domination entity is complemented by a symbolic way in making the nation's territoriality visible.



Increasing Toll Charges
The constant increase in toll charges for the Causeway and the already high costs of the Second Link cause an economic filtering effect.

Stronger Controls
The filtering process at the Causeway often falls in the hands of Singaporean immigration and customs officers, who "for security reasons" conduct highly selective and discriminatory practices. The filtering process contributes to the massive traffic jams on the Causeway leading into Singaporean.



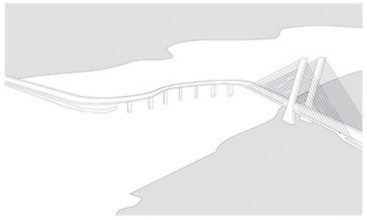
Checkpoint Buildings
Loudly proclaiming the territorial authority, one gigantic machine-like building, as the one from Johor Bahru depicted here, "welcomes" the visitors on each side of the Causeway.

"Bargaining Chip"
The transport links can also be understood as a "tit-for-tat" exchange, as between Singapore and Malaysia. They act as a "bargaining chip" in the political and economical relationships between the two countries. The pushing and bargaining between the two countries happens on different levels. As shown above, the dependence of Singapore on Malaysia for water supply, and the employment many Malaysians have in Singapore.

"Collision Point"
The transport links can be depicted as "collision points" between different policy regimes. There is no evidence of a will to resolve these political discrepancies via any kind of cooperation.

"Figurative Bridges"
Neither Singapore nor Johor has seen the Causeway or the Second Link as "figurative bridges", i.e. as representative of a potential for cooperation between the two nations. The implementation of transport links doesn't seem to be perceived as a possibility to collaborate towards a globally competitive cross-border region, in spite of the central concept behind the Indonesia-Malaysia-Singapore Growth Triangle to create an "extended metropolitan region".

Trading for Water Access
The Second Link is a site of real friction between Singapore and Malaysia. Both countries have considered different approaches to recovering the costs and managing demand on the new bridge. This discussion created a standstill over the toll rates and eventually created an unfavourable situation for both nations. Since its completion in 1998, the bridge has not been used to its full capacity.



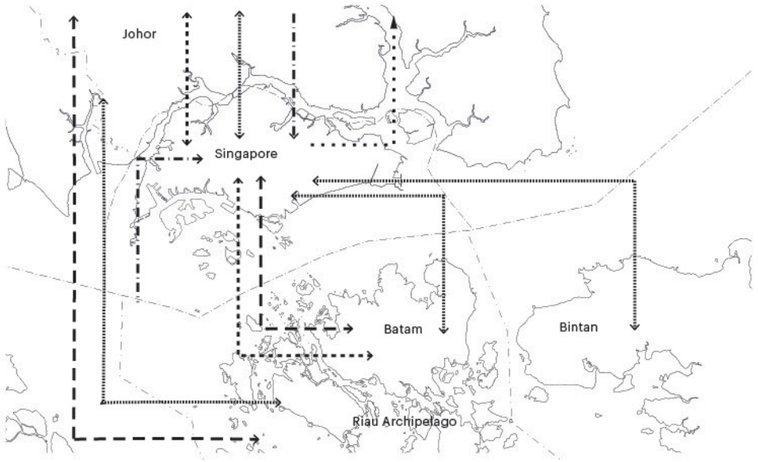
The "Scenic" Half-Bridge
Since the 1990s, Singapore and Malaysia have had a back-and-forth discussion on the necessity to replace the Causeway with a bridge. Reopening the Johor Strait to maritime traffic would benefit Malaysia, but Singapore has been opposed to the project. Instead, Malaysia has presented a proposal to turn its side of the Causeway into a "crooked", or better, "scenic" half-bridge.

"Rebordering" Instead of Cooperation
The construction of the Second Link was meant to augment flows of resources between the two nations. Instead of becoming a connection it became, and is now another mean of imposing Singaporean or Malaysian sovereignty, with a checkpoint built on both ends of the bridge. Moreover, the impasse created by the lack of cooperation between the two countries, which contemplated different approaches in order to recover the costs and to manage the tolls on the new bridge, caused eventually a lose-lose situation. The bridge was in fact never used to its full capacity.

Human Mobility in the SIJORI Region

The dynamics of cross-border interactions and movement within the region are extremely complex. It is necessary to separate the flows in different categories, principally into "work" and "leisure". Singapore can be seen as the economical centre of the entire region. More global companies are headquartered there, whereas Johor and Riau more often function as Singapore's hinterland, where the services and industries of Singapore-based companies can profit from comparatively low wages and cheap land.

Part of Singapore's economic advantages result from its status as a global transportation hub. Goods produced in the region are shipped worldwide from Singapore's harbour; Changi Airport connects passengers from the region to destinations around the world. Singapore's centrality is evidenced in the way people move across the regional triangle.



Reasons for Movement

- Work (daily commute)
- Work (weekly stay)
- Leisure (shopping/ tourism)
- Medical care
- Living/Retirement

Singapore- Johor / Johor- Singapore

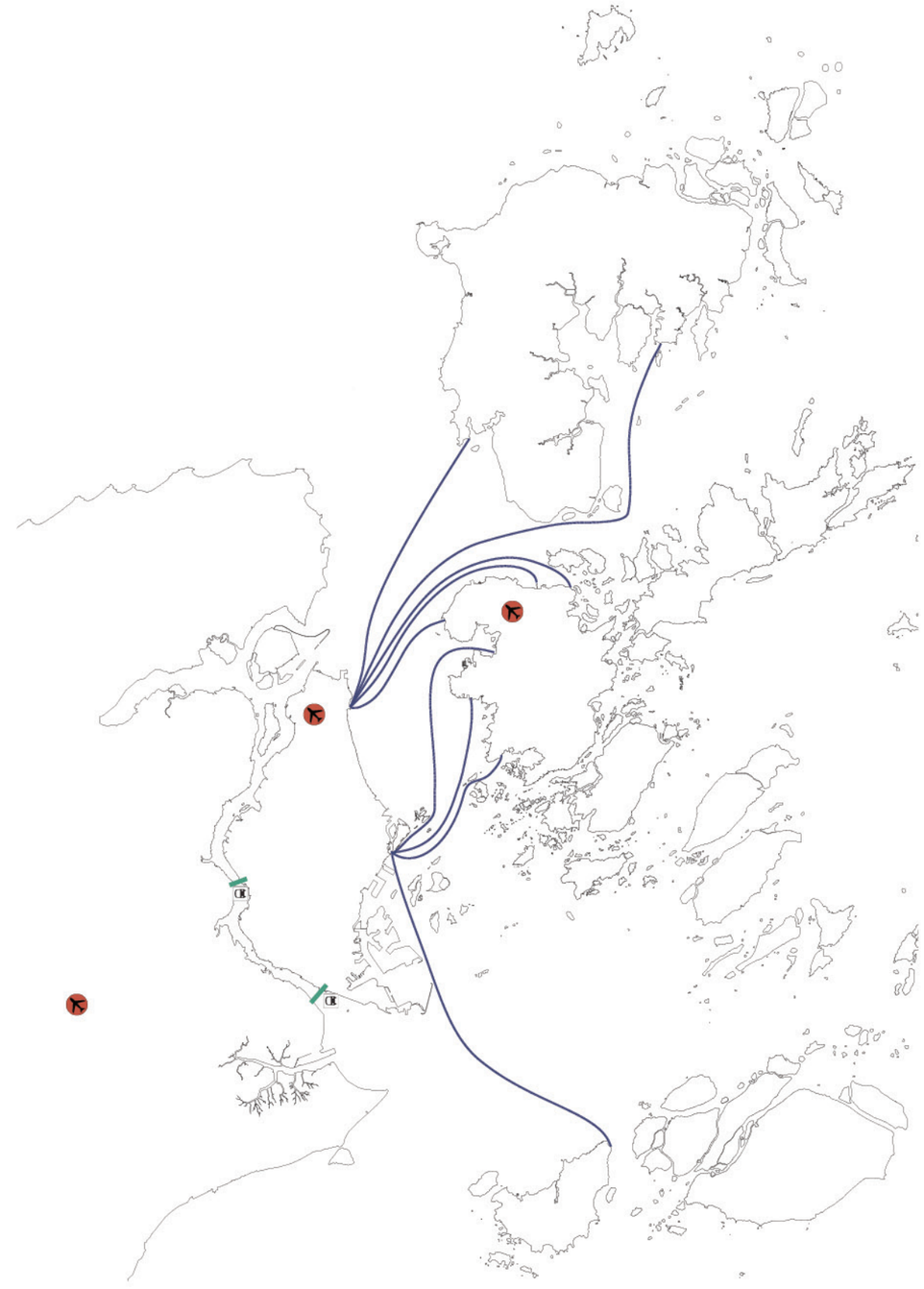
Thousands of Malaysians commute daily from Johor, where the cost of living is lower, to work in Singapore, where they earn higher wages. A smaller number of Singaporeans have moved to Johor, either as commuters or as retirees, in order to improve their standard of living. They tend to move their entire family there, to keep their familial ties strong. Singaporeans cross the border for various reasons: to access a Singaporean-level education, to get medical treatment, or for social activities. Singaporeans often travel to Johor on the weekend for cheaper shopping.

Singapore-Riau / Riau-Singapore

A daily commute to Singapore is still not affordable for most Riau Islanders. They often rent accommodation in the city-state, returning home on the weekends or for longer holidays. In recent years, many Indonesians from all over the country have moved to Batam to work in the growing manufacturing industry based there. Inversely, only 300 Singaporeans live in Batam, either at global companies and or with their own businesses. Recent resort development on Batam and Bintan has made the Riau Archipelago a destination for Singaporean tourists.

Riau-Johor / Johor-Riau

The ties between Singapore and Riau and Singapore and Johor seem to be stronger than those between Johor and Riau. These regions are competitors in the low-wage market. Nevertheless, Bintan and Johor serve each other as leisure destinations.



Interregional Plan

- Sea connections
- Land connections
- Airports

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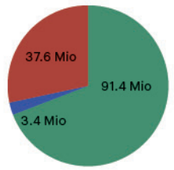
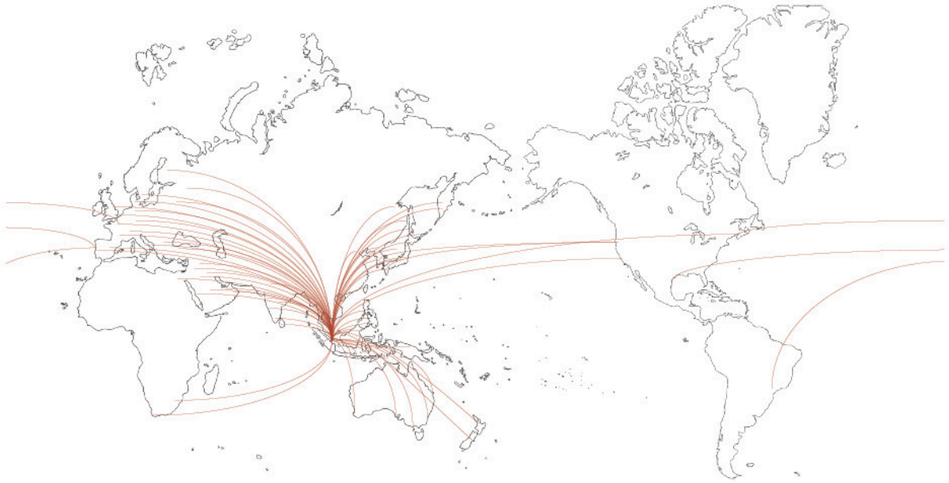
Number of Border Crossings to Singapore



The graph shows the number of foreign border crossings into Singapore. Almost all travellers coming by Land are from Malaysia.
Travellers by boat are mainly from Indonesia.
Despite the geographically strong link to both regions, Singapore has 30 times more Malaysian border crossings than Indonesia.



Singapore's air connections

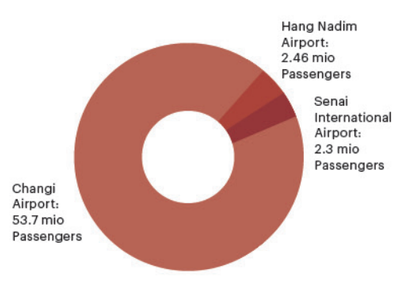
Integration in the Global Network

While the region relies mostly on land and sea connections, global connectivity requires the efficiency and speed of air transportation. Within the region there are three major airports: Changi Airport in Singapore, Senai International in Johor, and Hang Nadim Airport on Batam. As one of the most important air traffic nodes in Asia, Changi is the region's largest airport and its global gateway.

While the two other airports only serve local destinations, they are able to operate in a lower price range. Neither airport links directly with Changi, however it is possible to connect to Changi by ferry and bus. Less than 1% of all Changi passengers connect this way.

Airport Region

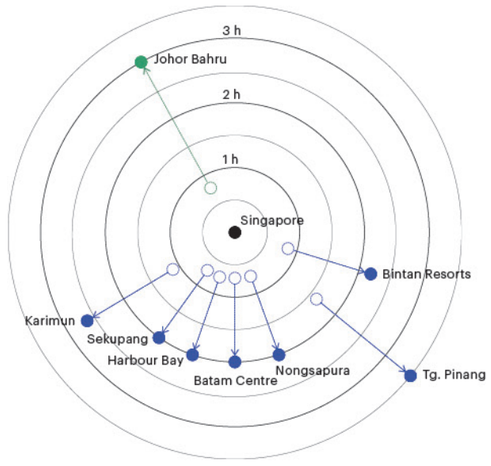
The map shows the three international airports of the SIJORI region, including the miniscule number of passengers that travel from one airport to the other for connecting flights. Due to its enormous international presence, Changi Airport can be regarded as the regional centre of passenger air transport.

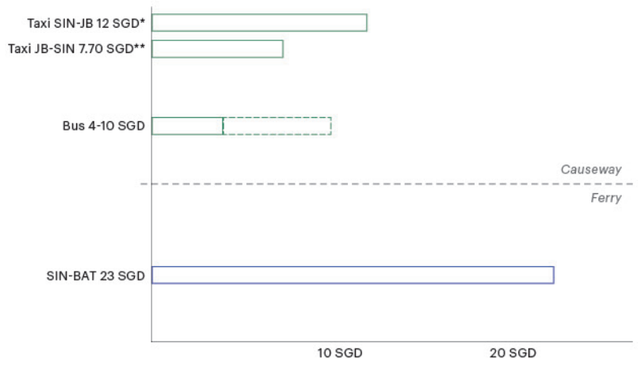


Constrained Accessibility

In any archipelago, isolation is a potential issue. In a region characterized by strong geographical diversity, as well as economical, political and social differences, access to transportation becomes an even more complex issue. Geographical distance is not the only factor in determining the connectivity of remote islands; but through measuring accessibility from a given starting point, it is possible to compare ways to reach a certain island, place or region.

In order to be able to give a clear answer to the issue of accessibility, certain parameters are needed and have to be implemented in the calculation model. These are: real travel time, density of the network, frequency of connections, and quality of connection. These travel times are in turn impacted by their political infrastructures. As SIJORI spans across three countries, border control and other political issues greatly influence travel times, making them unpredictable. Cost of visa is another important factor as average salaries vary up to 90% in the three different countries. This means, that even if the crossing is possible, it might not be financially feasible for every passenger.





Distance and Costs

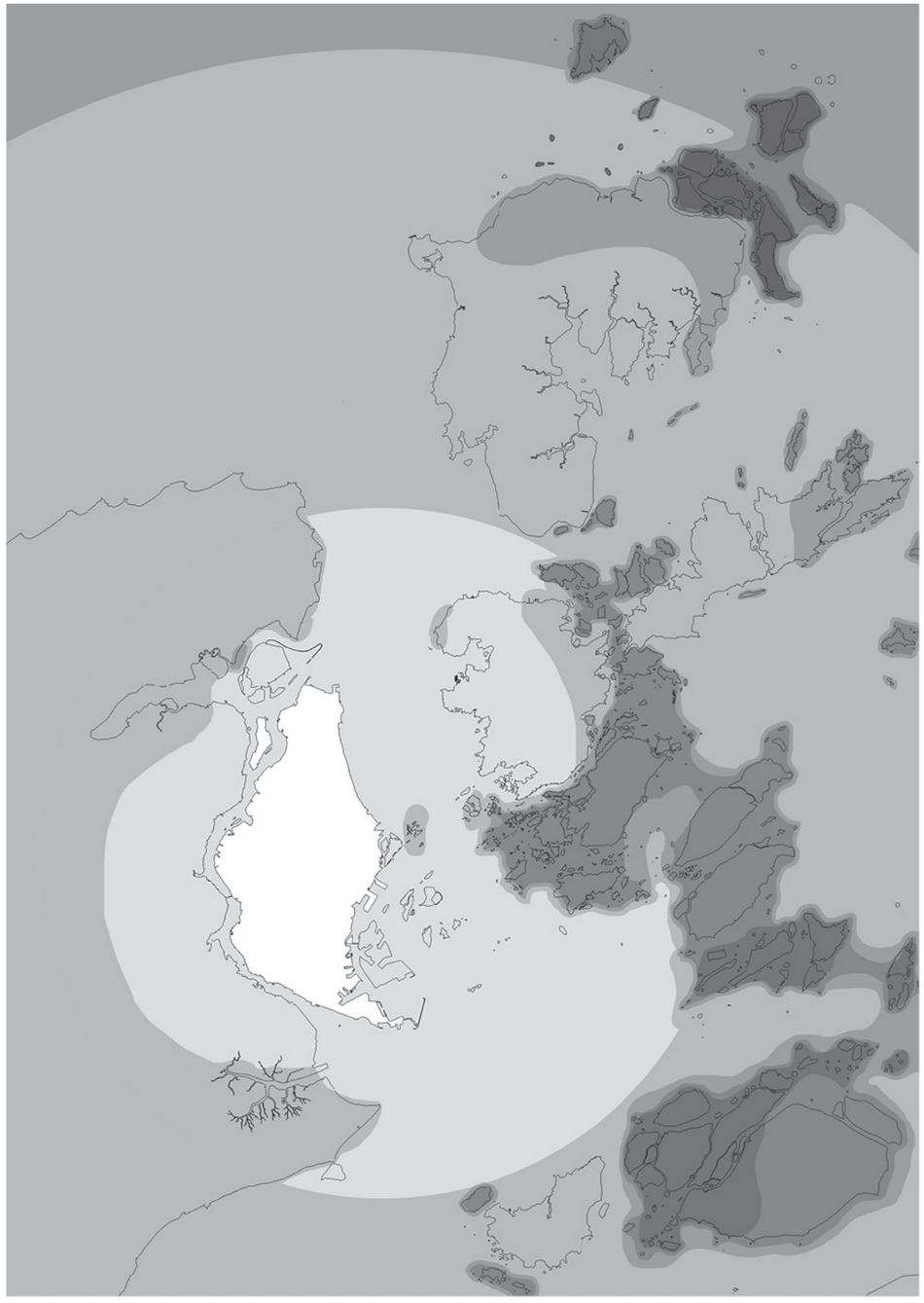
The diagram shows the actual time needed to reach certain destinations when starting in Singapore. The empty circles show a projected travel time, given changing and improvement of the border crossing process and increasing the general speed of transport.

The diagram middle shows the prices for a cross-border journey from Singapore to Johor and from Singapore to Batam. The connection to Johor coasts less than going to Batam. This factor may be the reason why there are roughly twenty-five times more commuters travelling from Johor to Singapore than from Batam to Singapore.

Accessibility from Singapore in Isochrone Lines (hours)

The map shows the accessibility by public transport (train, ferry, bus and MRT) starting from Singapore when travelling to destinations in the surrounding region. To draw these isochrone lines, a calculation is performed that uses variables like the weekly frequency of connections, travel time and standard waiting- and boarding time at the port.

The concept was introduced by "Island Studies Journal, Vol. 9, No2, 2014, pp. 293-306", where it was used in a study on the accessibility between Athens and the Aegean Islands in Greece.



Accessibility in the Region

- 0-3 h
- 3-6 h
- 6-10 h
- 10-15 h
- 15-20 h
- 20-25 h

0 5 10 km N

The calculations on which the map is based on are calculated with the following formula:

T=BT+RT+TF

Where:
T= Total Time in hours
BT= Boarding Time in hours (time required to get to the port and board on the boat)
RT= Real travel time
TF= Factor for indicating the Frequency of ferries on a certain route per week.
TF=P*168/NF

The Boat and the City

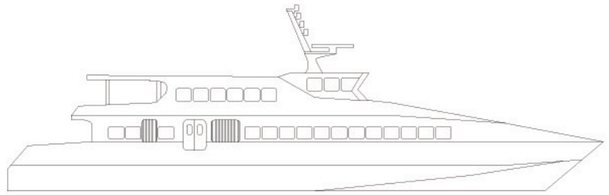
Multiple sea transport networks unite the trinational region. This infrastructure consists of diverse types of vehicles and terminal typologies. Modern, air-conditioned ferries hurtle across the Strait on fixed routes and scheduled times, bringing commuters and tourists from one shopping mall-terminal to the next. Nearby, small hand-made traditional wooden boats flit from island to island carrying people and goods from well-built concrete piers to precarious wooden jetties, connecting traditional kampungs to the hectic urban centres. These contrasts - local transport in wooden boats and high-speed, highly regulated cross-border travel - characterise the multidimensionality of passenger mobility within the sea region.

A Comparison of Boat Typologies

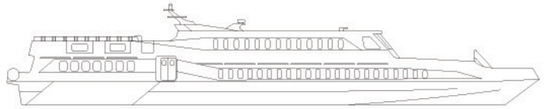
A number of different boat typologies are used, depending on the location and type of passenger. The boat operators are just as diverse. In some places the competition for transport is very high, while others have fewer operators.

Government can hand out concessions to secure the connection, and make sea transport affordable to the public.

Location of Ferries
The map shows the location different ferries within the region at a defined time during a weekday (Source: "Marine Traffic").

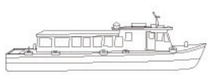


Ocean Ride
Speed (knots) 20-28
Capacity (pers.) 150-300



Dumai
Speed (knots) 24
Capacity (pers.) 270

Island Cruise
Speed (knots) 10-15
Capacity (pers.) 50-100



Bumboat
Speed (knots) 10
Capacity (pers.) 12

Pancung
Speed (knots) 10
Capacity (pers.) 16-40

Ferry Typologies in the Region
At least five different ferry typologies are observed in the region. The difference in size is clearly visible. Each of the boat serves a different purpose and is used on different routes. Different companies or private owners operate them.

Top:
Boarding a ferry in Tanjung Pinang.

Below:
Ferry Baruna Jaya

The Modern Fast Connection

Entering the mall in Harbour Front Terminal was a disorienting experience. Its large shopping mall conceals the ferry terminal, but regular signposting guided us to the ticket counters. There were five ferry operators, all offering similar prices, so we just chose the soonest departure time to our desired port. Before the trip began, we had to cross the border to leave Singapore, which involved going through security and passing customs. At peak times, the wait can be quite long, but our process was fairly smooth. The actual trip began after reaching the berth and boarding the speed ferry. In the closed, air-conditioned cabin, it is difficult to perceive the sea's undulation. As we left the impressive landscape of Singapore's large cargo terminal behind, a strange quietness pervaded the room. Other than the distracting, animated movie playing on the screens, it was a restful and relaxing time before arriving in the chaotic Batam ferry terminal.

1.
Pandan's industrial surroundings

2.
People and goods squeezed on a pancung

3.
Waiting for the next ride at Belakang Padang

The Traditional Way

Next to the international ferry terminals in Sekupang, we encountered a different kind of sea transport: dozens of wooden boats floating around a crowded jetty. There were no formalities or regulations here; we bought the ticket right before getting on board the traditional "pancung". Stepping into the boat was difficult because of the strong sea, but we eventually managed to sit down. The narrow wooden bench wasn't very comfortable, but it would do for a short trip. The boat was crowded with people and goods to be transported all over the archipelago.

As the motor started to rumble, the wind began to blow, and mist rose from the pancung's wake. We tourists enjoyed the experience, but the locals sat inside the closed plastic canopy, shutting out part of the beautiful island landscape from their view. Docking in Belakang Padang brought other surprises: a completely different world, only a few kilometres away from Singapore's skyline.

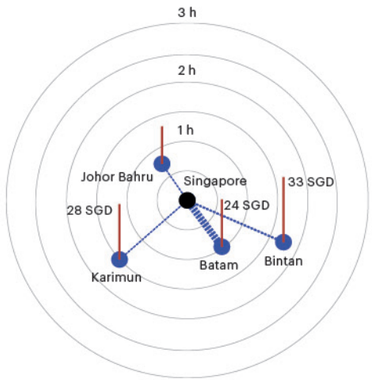
2.

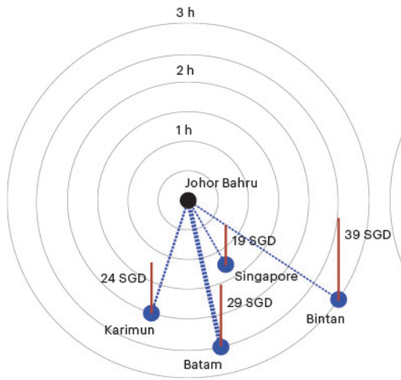
3.

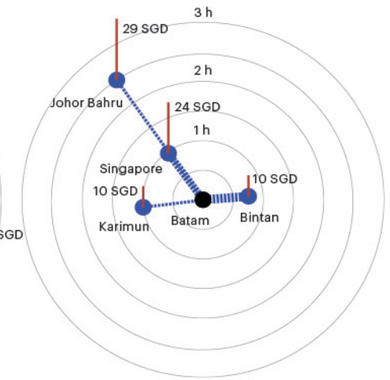
Fast Ferry Network

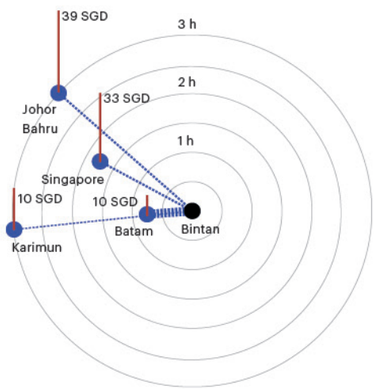
In terms of transport modalities and inter-regional connections, the regional triangle can be split in two: on the one side, Singapore and Johor are almost entirely connected by the Second Link and the Causeway; on the other side, the Riau Archipelago, which is only reachable by ferry. With few exceptions, the Islands of the Riau Archipelago are only connected to each other by ferry.

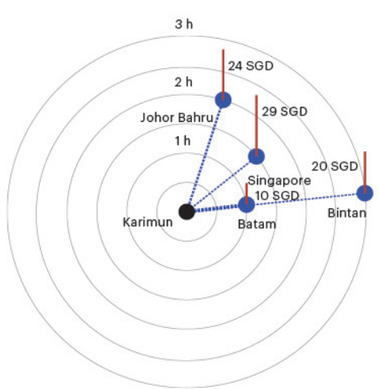
This chapter presents all of the region's scheduled international and national connections. In terms of frequency and passenger flow, the most prominent ferry link is between Singapore and Batam. It is more reliable than the links among the Riau islands, or even the ferries between Riau and Johor. Once again, Singapore is at the centre of all of these regional ties.





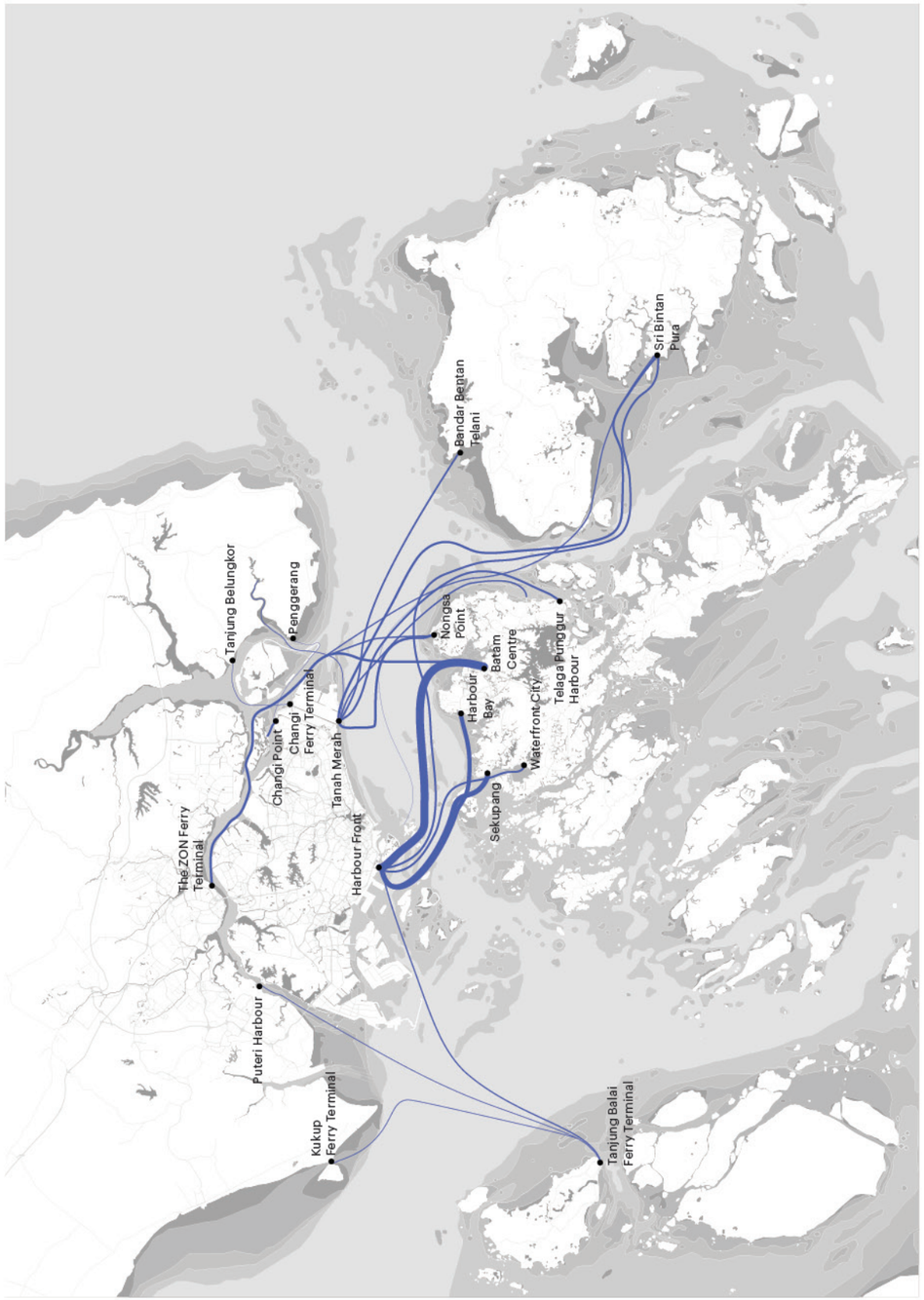






Comparing Five Regional Centers Regarding their Sea Connections

The graphs show a qualitative comparison of frequency, duration, and prices for connections within the region. The five points stand for the five biggest cities of the region: Singapore, Batam, Bintan, Johor, and Karimun.



International Ferry Connections

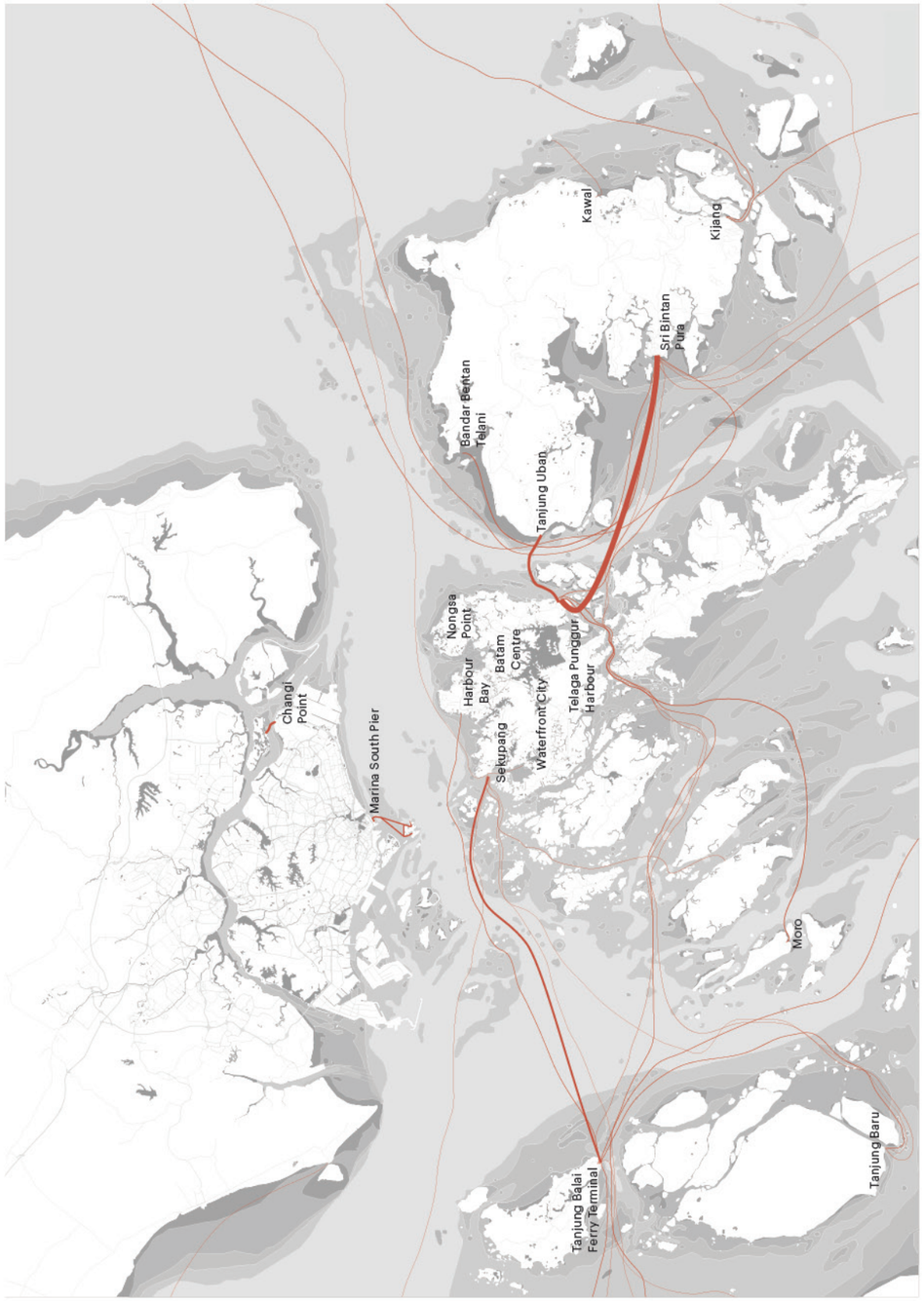
Ferry route
Ferry terminal

0 5 10 km N

The map shows all cross border Ferry Connections in the border triangle. The most frequent connections are between Harbour Front and Batam Centre.

Scheduled Ferries in the Region

The national ferry connections are surprisingly diversified in the Riau Archipelago. Among the strongest ferry connections in the whole region is the one from Telanga Punggur to Tanjung Pinang, which is frequented by a lot of commuters on a daily basis.

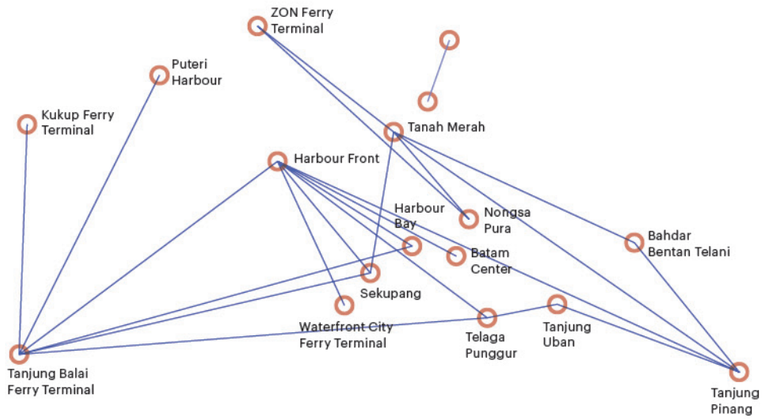


National Ferry Connections

Ferry route
Ferry terminal

0 5 10 km N

The map shows all cross border Ferry Connections in the border triangle. The most frequent connection is between Telaga Punggur and Sri Bintan Pura in Tanjung Pinang.



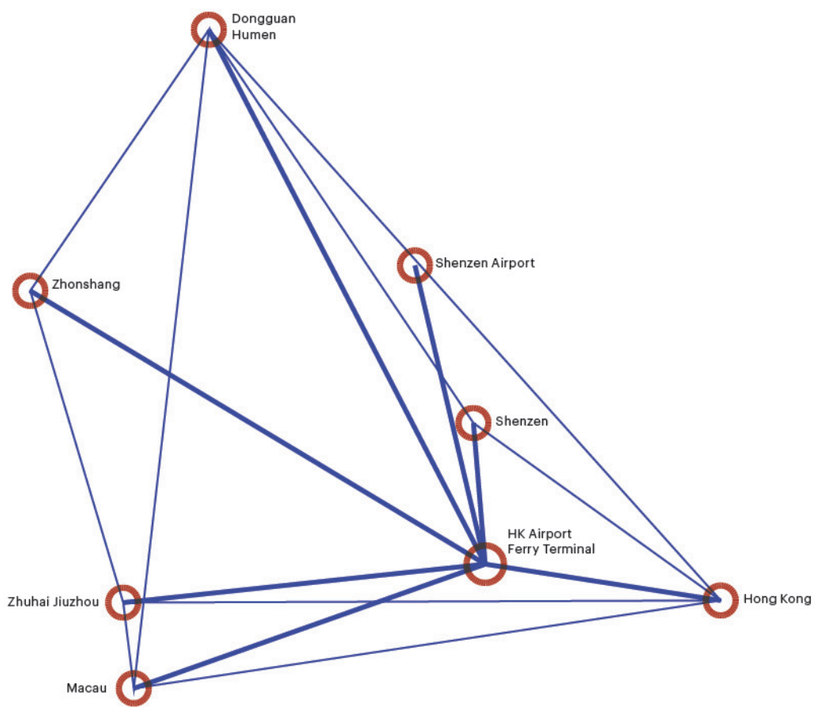
Sijori Region: Existing Fast Ferry System and Major Ferry Terminals

Terminals
Ferry connections

0 2.5 5 km

Framework of Ferry Connections

The schematic depiction of the international and interregional fast ferry connections shows how decentralized the SIJORI sea transport network is. Dense routes across the Straits define a primary traffic line, but the rest of the network is scattered. For example, from two destinations in Singapore, it is possible to reach five terminals in Batam, which in contrast have none or little other connections to other terminals.



Pearl River Delta: Existing Fast Ferry System and Major Ferry Terminals

Terminals
Ferry connections

0 2.5 5 km

Comparison to Pearl River Delta Fast Ferry Network

Unlike the SIJORI region, the Pearl River Delta has an important hub in every urban centre in the region. These transport hubs are connected through fast ferries, offering a faster journey than travelling by car. As the central point in the network, Hong Kong airport acts as important node in the intermodal-traffic exchange.

0 20 km

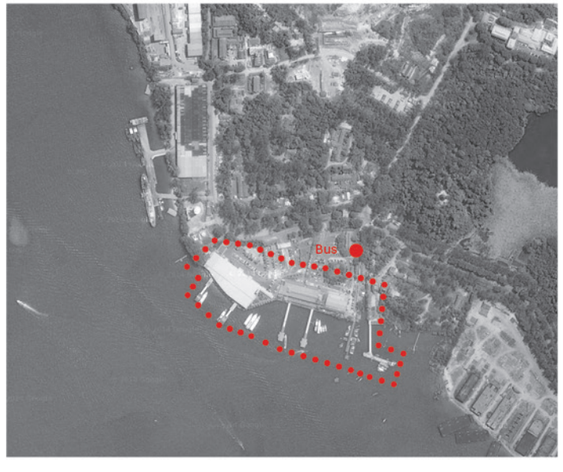
Ferry Terminals in the City Fabric

Where two or more public transport systems meet at a node, it is important to increase efficiency in the transition from one transport mode to the next. Differences in scale of access at each ferry terminal – international, national, or local – produce very different architectural typologies, as demonstrated in the examples on the following pages.

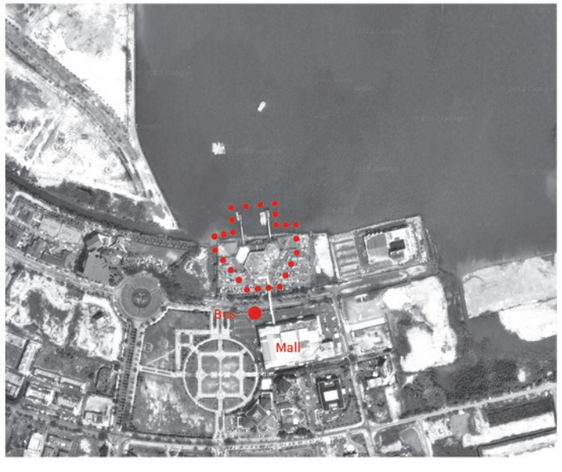
Central and Peripheral Terminals
Some terminals are well connected to the network and the city centre. Others are built in the outskirts, which reduces their accessibility and increases the time to reach them.

Harbour Front, Singapore
The main ferry terminal of Singapore, located on its south coast, near Sentosa, offers international connections to both Malaysia and Indonesia. It also functions as a terminal for cruise ships. Harbour Front terminal is housed within one of Singapore's largest shopping malls, VivoCity, which also contains an MRT station.

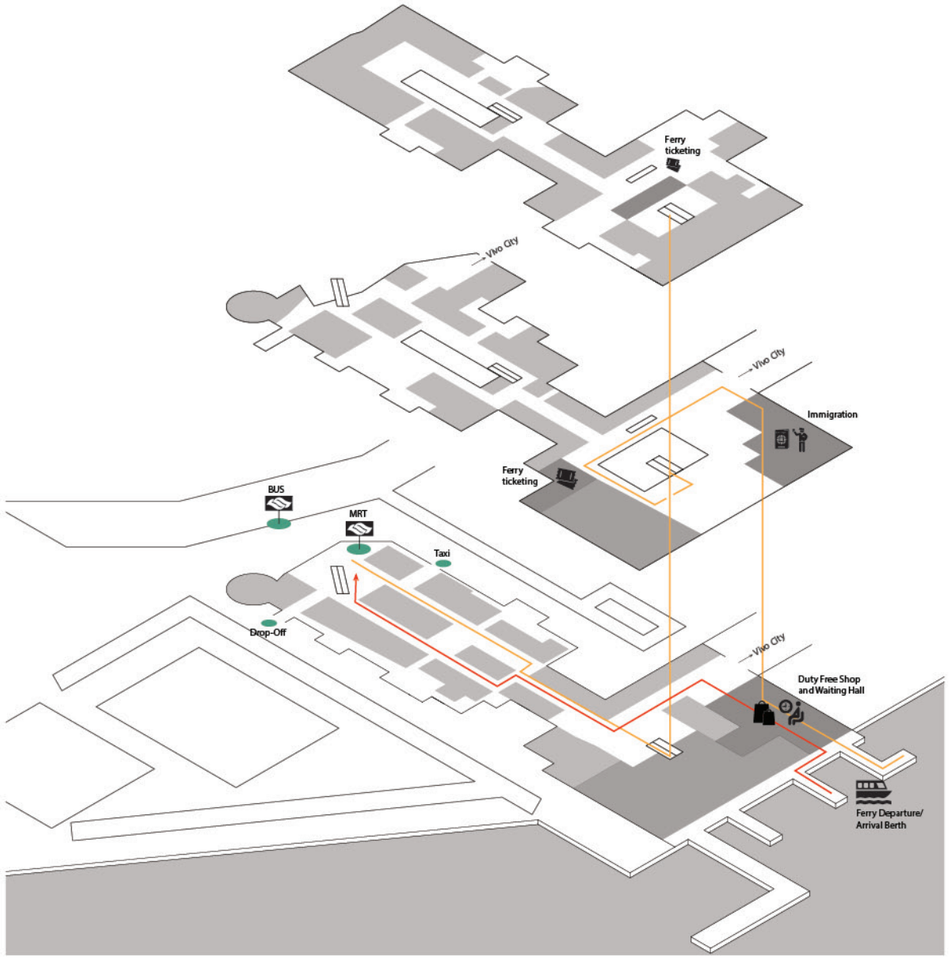
Tanah Merah, Singapore
Situated next to Changi Airport, this terminal is far from the city and lacks sufficient public transport connections. Compared to Harbour Front, this terminal has limited connectivity to other major terminals in the region, and mostly serves tourists travelling to Bintan Resorts.



Sekupang, Batam
Sekupang terminal lies on Batam's outskirts, which makes it difficult to access, even by taxi. A bus service operates infrequently between Sekupang and Batam Centre. Sekupang offers frequent international service to Singapore, national connections to other major Indonesian cities, and as a node for local sea transport to the kampungs on Batam's west coast and outer islands.

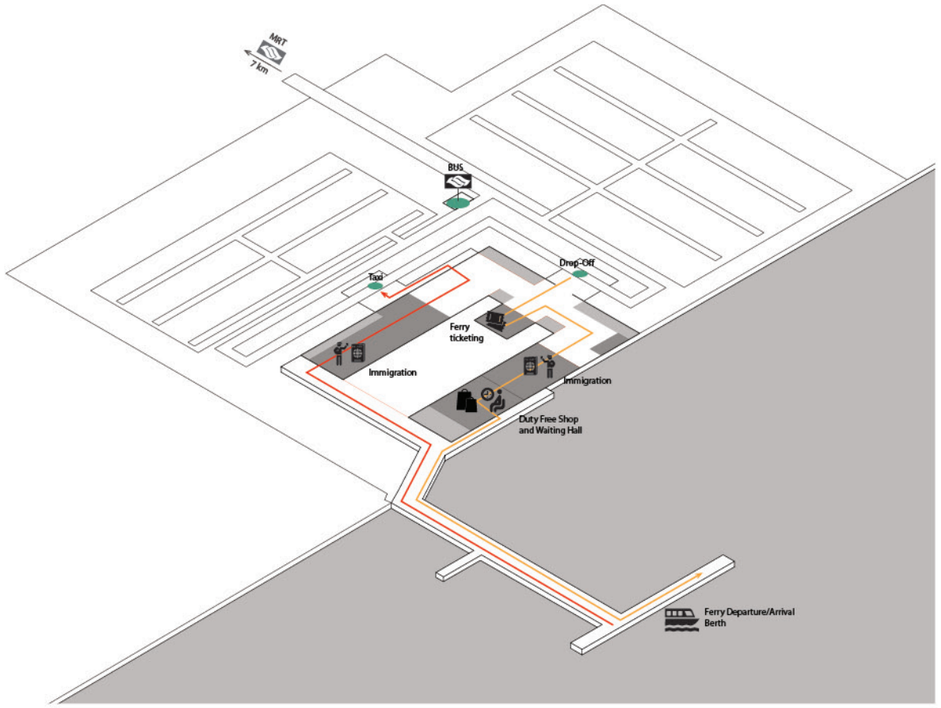


Batam Centre, Batam
Batam Centre is an important regional traffic node with the most frequent connections to Singapore as well as various connections within the Riau Archipelago. In emulation of Harbour Front, Batam Centre is part of a "MegaMall." Except for an intermittent bus service, there is no public transportation to connect to the rest of the island.



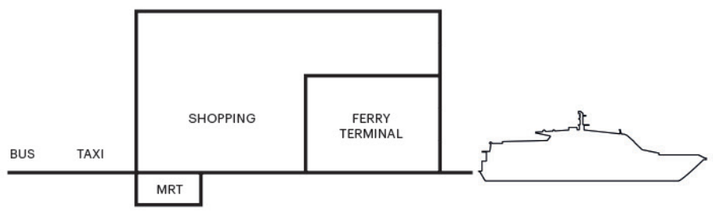
Functions

- Ferry terminal
- Cruise terminal
- Shopping mall
- Departure
- Arrival



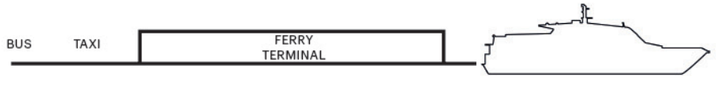
Harbour Front

Using Harbour Front as example, the aim is to show how a sea terminal can also serve as a inter-modular transport exchange. From Harbour Front, reaching the city is very direct and easy, as the MRT station and bus stop are located within the terminal building, which combines shopping and dining options with transport.



Tanah Merah - The Mono-Modal Terminal

With one bus connection that runs every half hour, Tanah Merah is quite difficult to reach by public transport. Although it is located near the airport, there are no public transit connections between them. Since it is a mono-modal terminal, the process of boarding is more immediate and simpler.



Flexible Small-Scale Connections

For centuries, transportation within the region was primarily sea-based, over time, transportation within Singapore and Johor slowly changed to land-based modes. However, it remained sea-based in the Riau because of its archipelagic geography. Today, some of the smaller islands are still only accessible by boat. The most flexible means of travel in the Riau is by private boat, which provides free movement within a certain range, at least to the next ferry terminal.

The smaller islands' limited access to the outside world is proving to be a hindrance in their growth. Young people are leaving the traditional kampungs for the big cities. In order to reverse this trend, connections between areas and the regional terminals must be improved. For instance, the government has established a few routes that operate with concessions or subsidizing, such as the routes from Sekupang to the western islands around Batam. These boats are important means of transport for goods and passengers. The government controls ticket prices to keep them affordable for the population. Although they operate on a regular basis, these ferries travel infrequently, making at most one trip per day.

Public transport boat landing at a village in the Riau Archipelago

Small-Scale Public Transportation

The government subsidizes a few local ferry routes on a regular yet infrequent schedule. It works like a bus system, where the boat follows a regular route with fixed stops and a timetable.

The boats are privately operated but sell tickets at government-controlled prices to keep it affordable. By introducing this very basic means of public transportation on more routes, accessibility for passengers and goods to more remote island settlements could be greatly improved.

Small-Scale Connections

Publicly accessible rural area

Water bus routes

0 5 10 km N

Areas where small-scale public transportation is available within the Riau Archipelago. This bus-like systems connects the islands with hubs on the main islands.

Routes with Government Concessions

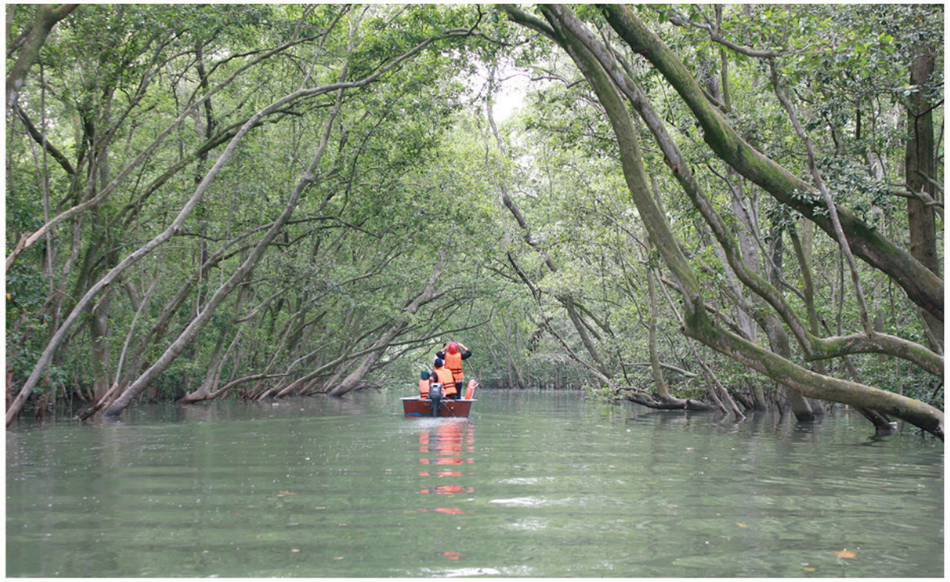
In this specific case, the government defines the route and a private owner operates the boat. The boatman has been granted a concession, which entitles him to offer this route. In return for having a monopoly on that specific route, the government defines the ticket price. The boat offers an important service, supplying the islands with food and consumer goods, as well as transporting passengers. This particular route operates one round trip six days a week, starting in Pulau Telukbakau at 7am and returning from Belakan Padang at 1pm.

Pulau Pangun; water bus that carries people and goods at Belakang Padang

Subsidised Route

In this case the government defines the route and operates the boat. This route operates free of charge, three times a week. By establishing a functioning route, the aim is to create a demand, so that eventually it can be privatised and transformed into a concession model, like the previous example.

A boat arrival at Pulau Karas Besar



1.

1.
A boat ride through the mangroves in Johor

2.
A traditional house built on the sea in the Riau Archipelago

3.
The Harbour at Belakang Pakang with a big number of private boats in the foreground.

Small Scale Private Boats and Water Taxis

Small boats, made of wood or fibreglass, are used for private travels. In terms of mobility, size, or capacity, they are comparable to automobiles. A fairly large number of people own a private boat, which increases their mobility within the region. However, their travel range is limited by distance, and weather and sea conditions. Boat owners often serve as water taxis for private hire.

2.

3.

Small-Scale Private Boats

Private boats for everyday life

0 5 10 km N

The map shows areas where small scale private boats are being used for everyday and commuting. It can be compared to a car on land.

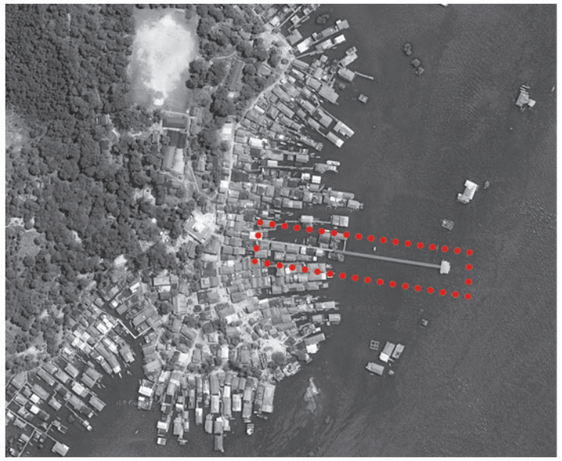
How Terminals Interact with the Urban Fabric

Typically, the local terminals are embedded in the urban fabric of the kampungs on the outer islands. Depending on the layout, size, and geographic location of the island, one or several jetties are built at the pancung's departure point. The main piers are concrete structures made by the government, while the secondary piers are simple traditional wooden structures built by locals.

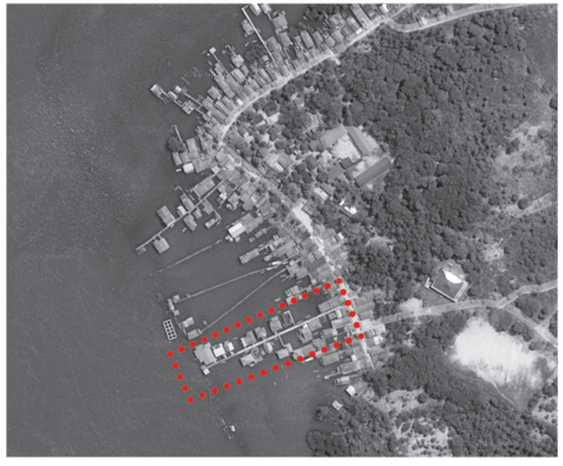
As the houses are built on the seashore and have their own piers, they demonstrate a strong land-sea connection. Together, the houses and piers form a linear strip that follows the coastline, incorporating the kampung's entire infrastructure into one urban system. As a result, most of the island kampungs have a similar urban morphology.

Sea-Based "Bus-Stops"
The spots on the map highlight kampungs of varied size, scale and public facilities, which are all part of the public transportation network.

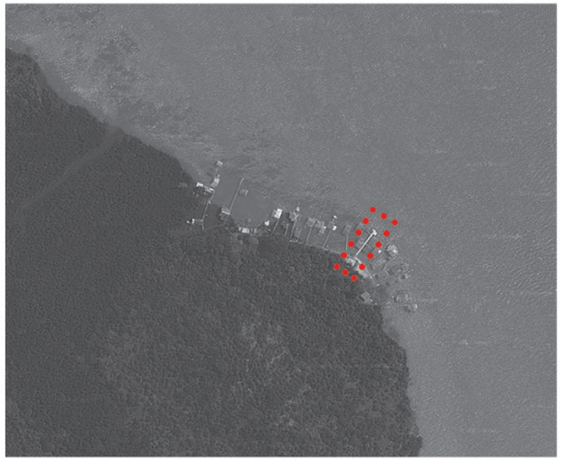
Belakang Padang
Belakang Padang was established as a trade port long before Batam developed. It is still one of the most important kampungs in this area, and operates as a main harbour to the islands west of Batam. Residents visit its market regularly. Most of the goods are ferried to Belakang Padang from Batam and then distributed throughout the area.



Pulau Kasu
Pulau Kasu does not have its own market, and industries sometimes function temporarily here. To purchase anything other than staples, people have to travel to the market in Belakang Padang.



Pulau Pecong
This island is very similar to Pulau Kasu, but with an even smaller population.

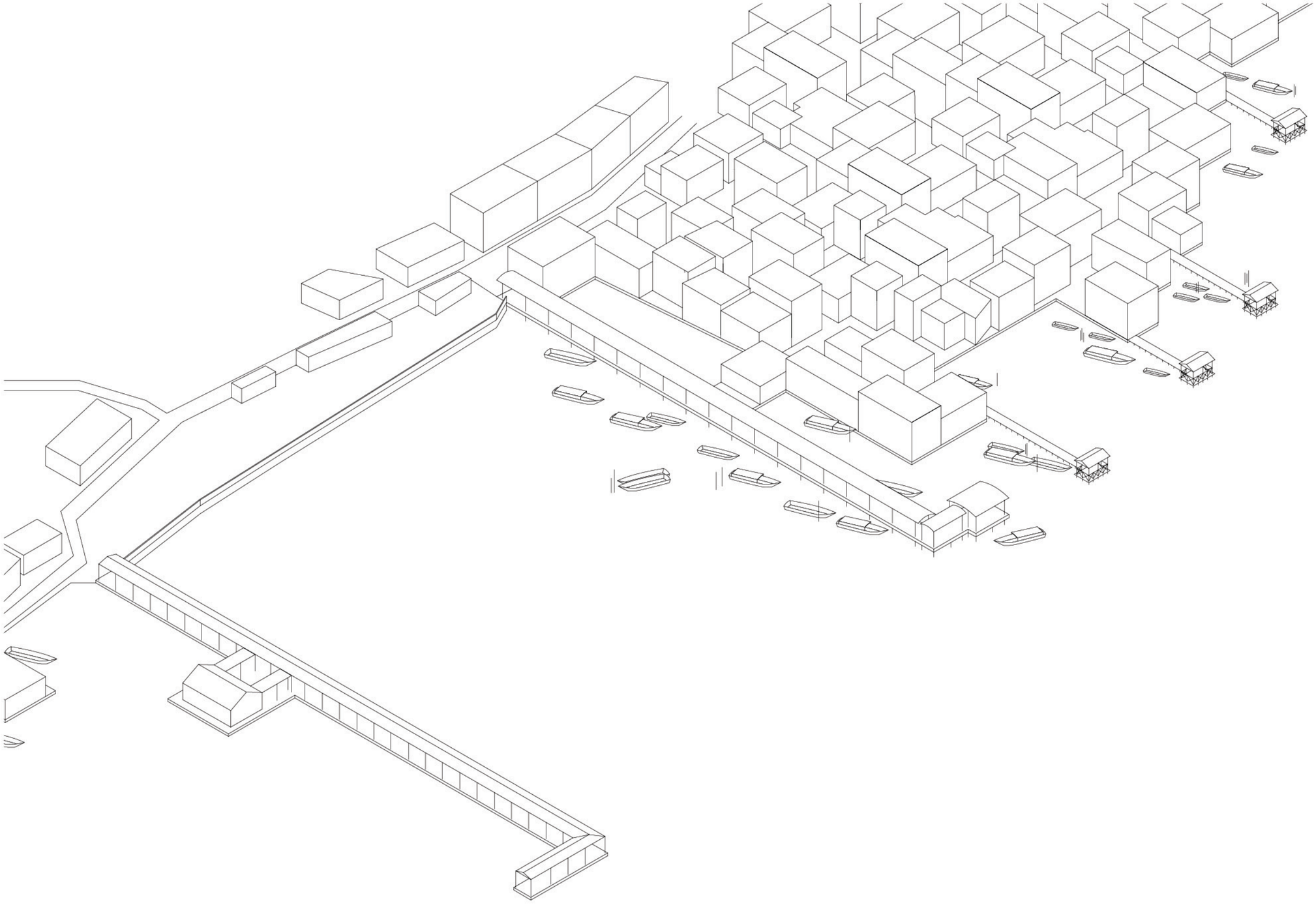


Pulau Ketumbar
Compared to the other kampongs, Pulau Ketumbar is extremely small and consists only of a few houses. This community's small size makes them even more dependent on the public transit route as a supply chain.

An Important Centre in the Archipelago

Before Batam was turned into a city of regional influence, Belakang Padang was one of the biggest and most important centres within the Riau Archipelago. Nowadays, although its greater regional importance has decreased, it remains an important centre for the smaller kampungs and islands to the west of Batam. From here, residents can get frequent ferry transportation to Batam's Sekupang Harbour. Since Belakang Padang has the area's largest market, goods are imported here and distributed across the islands.

The jetties are organized depending on the destination of each boat. The main pier is made of concrete, while the other piers are built in wood in a more informal way.



The Accessibility of the Coastline

The urban centres of Singapore, Batam, and Johor have surprisingly little public access to the sea. The three cities were developed inland, with their coastlines occupied by industrial production sites and larger housing developments. The few publicly accessible coastal areas are widely distributed and poorly connected to the city centres and each other.

1.
Publicly accessible parts of the coastline in the region.

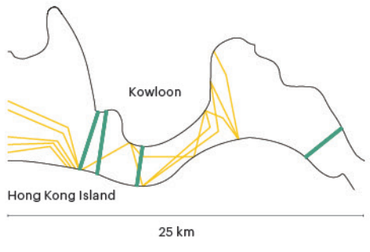
Urban Centres with Limited Connection to the Sea

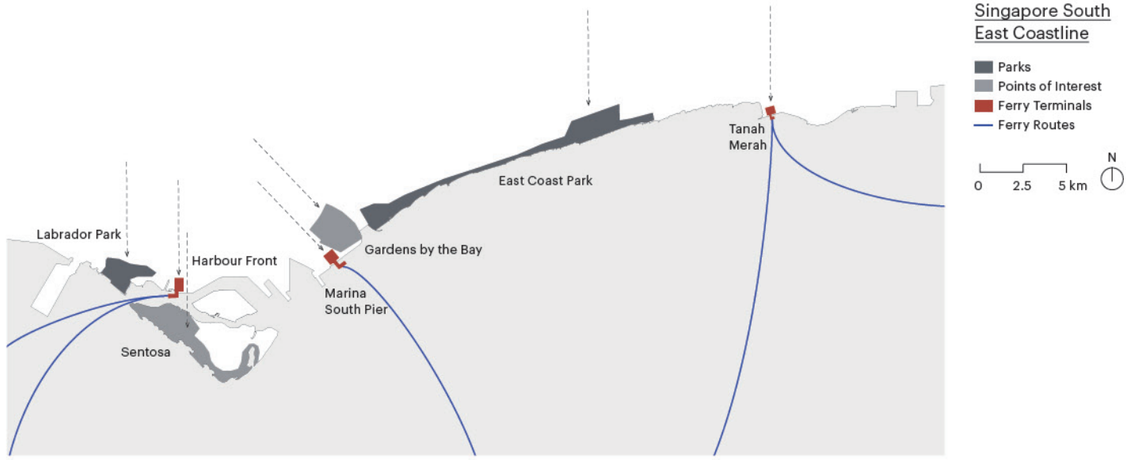
Johor Bahru, Singapore, and Batam have developed into land-based urban centres. They are removed from the seashore, with limited access from the city.

As shown in previous research, only 7.5% of Singapore's coast is publicly accessible. The rest of the coast is taken up with industrial areas, military zones, nature reserves, and private estates. Similar trends are visible in Johor Bahru and Batam.

Victoria Harbour, Hong Kong

Different modes of transportation - highway tunnels, underground MRT lines and ferries - connect Hong Kong's main island to Kowloon across Victoria Harbour. The coast is lined with points of interest such as museums and cultural centres, where the public can access the sea.



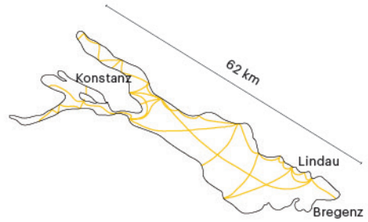


The Fragmented Public Shoreline

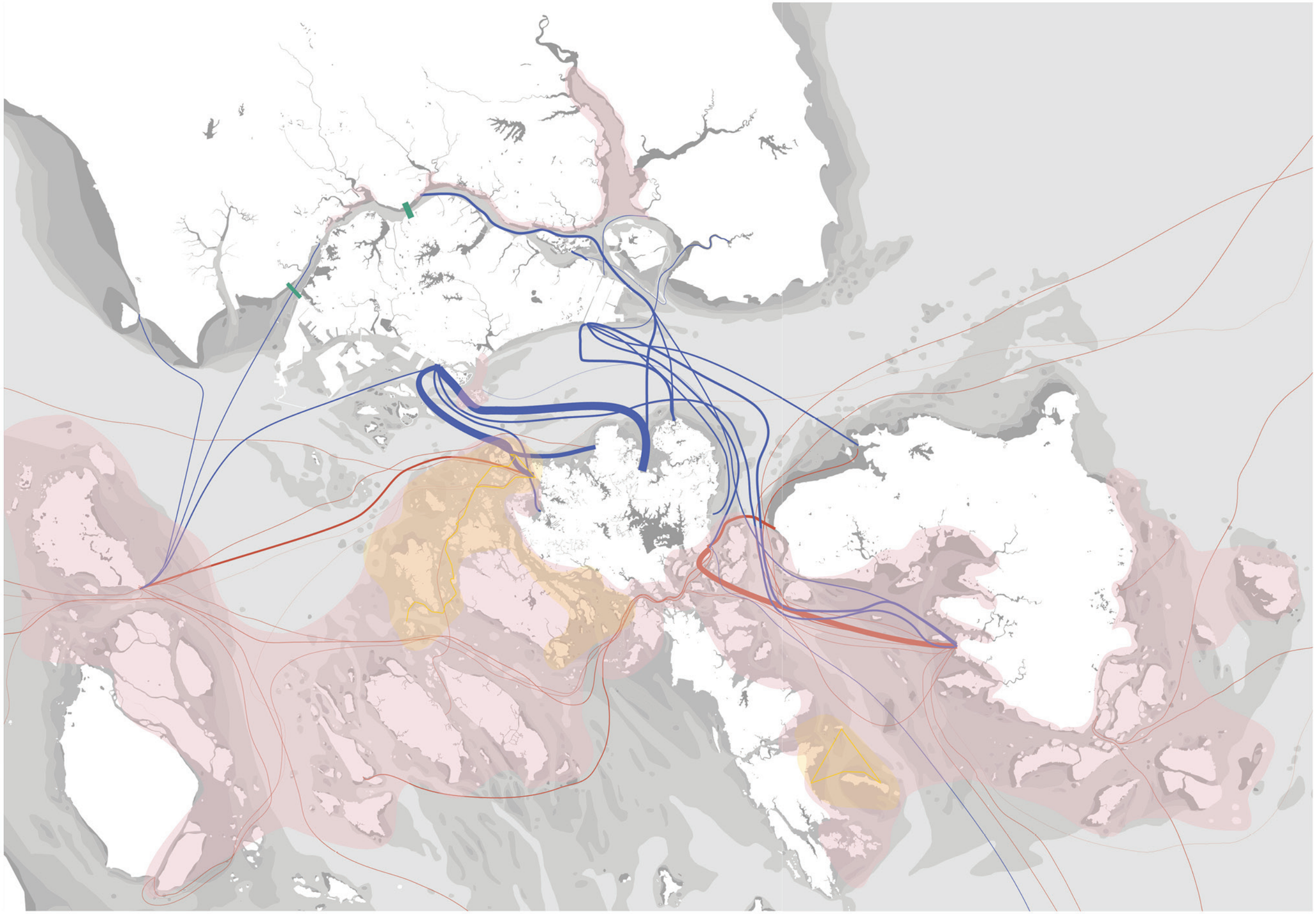
Singapore's highest concentration of publicly accessible stretches of coastline is found along the east coast, where the two largest ferry terminals are also found. Park connector trails link points of interest in this seaside park to the city. There is no interaction between this public park and the ferry terminals, the city's gateways to the sea.

Lake Constance

The shores of Lake Constance, a lake on the border of Switzerland and Germany, are dotted with small towns and villages. Not all the coastline is publicly accessible, but points of interest are accessible from land by car, or by lake via a system of hop-on-hop-off boat services that sail from town to town.



The Public Coastline at Changi as a leftover Space

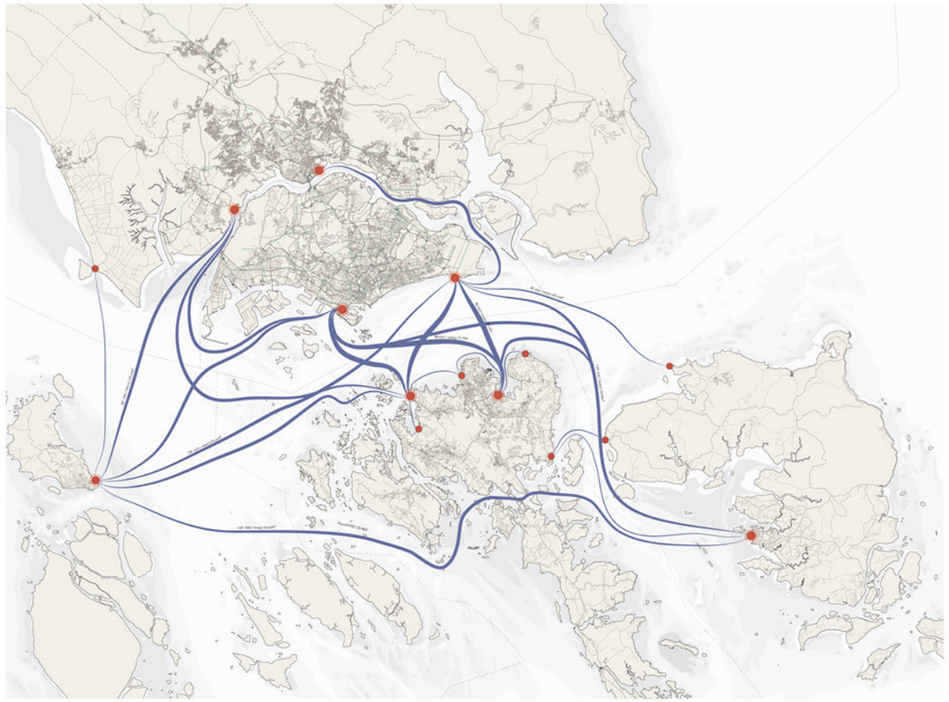

Layers of Transport Typologies
International ferries
National ferries
Scheduled local connections
Flexible local connections
N
0 5 10 km

Network of Increased Accessibility

The central aim of the project is to facilitate connectivity between points through the region, by streamlining, extending, and improving the existing transportation structure.
The secondary goal was to present alternatives to the existing inflexible land-based connections by re-introducing the region's traditional sea-based transport.
On a practical level, the project will improve and refine existing connections to reduce travel time. On a conceptual level, the focus is on re-establishing a relationship with the sea through experiencing the coastal and nautical heritage of the region.

Experiencing the
Johor Strait


Network
of Increased
Accessibility
Railway
Main road network
Fast ferries
international and
interregional
connections
Sea transport as an
alternative: Crossing
the Johor Strait
Connecting centres
and peripheries
Sea transport as urban
experience:
Hop-on-hop-off
Primary hub
Secondary terminal
Tertiary terminal
MRT coastal station
MRT station
Informal terminals in
kampungs
Jetty
0
5
10 km
N



Regional map with fast ferry connections and hubs

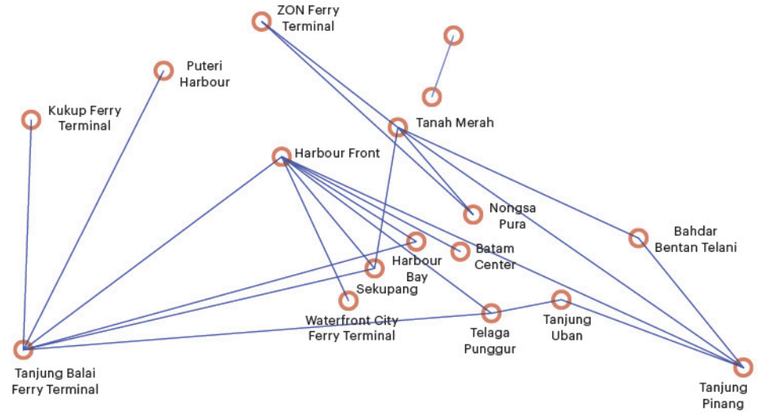
Fast Ferry Connections

As a first step, the project increases large-scale transport efficiency for international and national routes. By establishing different hierarchies for the existing ferry terminals, a limited number of strategically sited hubs in the urban fabric would connect to the region via fast ferries. In addition to centralization, the advantages include greater frequency, improved efficiency, and reduced travel time. We propose reducing the six different ferry operators to just one. This measure would simplify scheduling and ticketing.

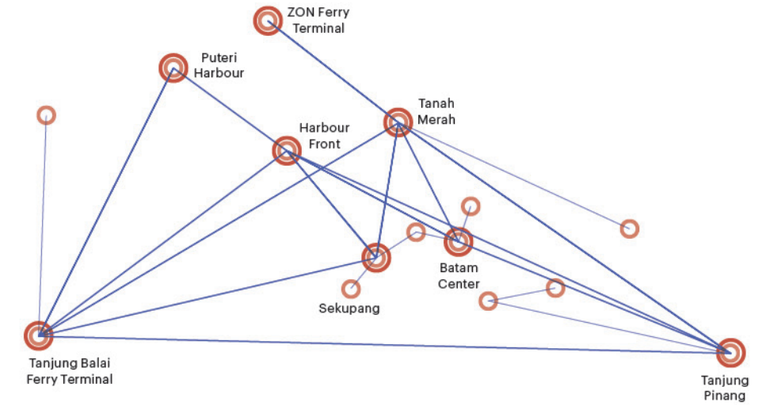
Identifying Hierarchy and Network Reconfiguring

Currently all terminals in the existing fast ferry network operate more or less equally. The large variation in frequencies of stops makes the system difficult for travellers to navigate. In the new proposal, eight key terminals will be transformed into larger hubs, which would be linked to one another in a regional network. More local terminals would link into these regional hubs, and connect with the local public transportation system. By establishing an organised and flexible hierarchy, the overall network would become more efficient and its structure simplified.

The Existing Fast Ferry System



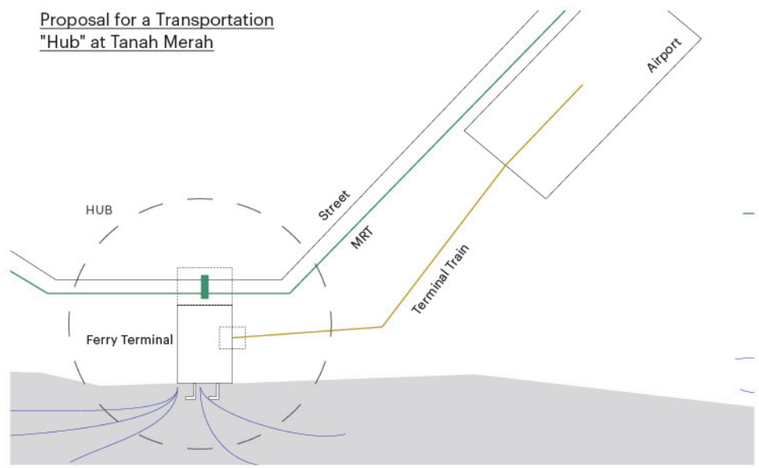
Proposal for "Hubs" and Connections.

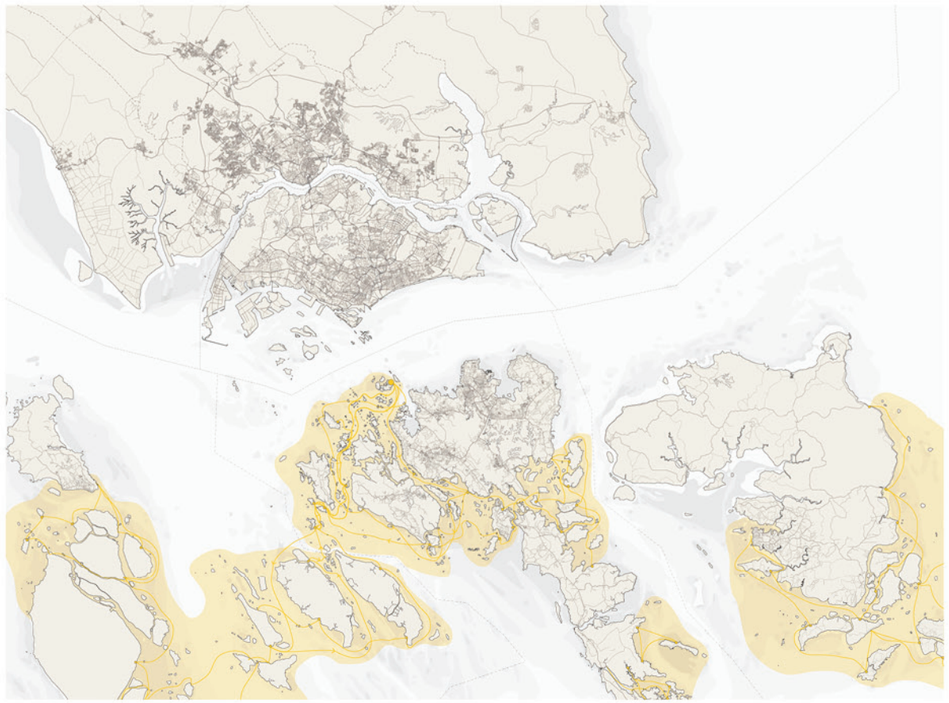


Tanah Merah: a Multi-Modal Hub

Establishing a new central transport hub here would take advantage of Tanah Merah's proximity to Changi airport, linking air, sea, and the city's MRT system. Fast ferries would connect the region with the world. Locating an integrated immigration portal here would expedite international tourist and worker arrivals. For example, Airport Basel Mulhouse, which is jointly operated by Swiss and French authorities, is located in French territory.

Proposal for a Transportation "Hub" at Tanah Merah





Shuttle Between the Islands

- Kampungs
- Existing route
- Implemented route

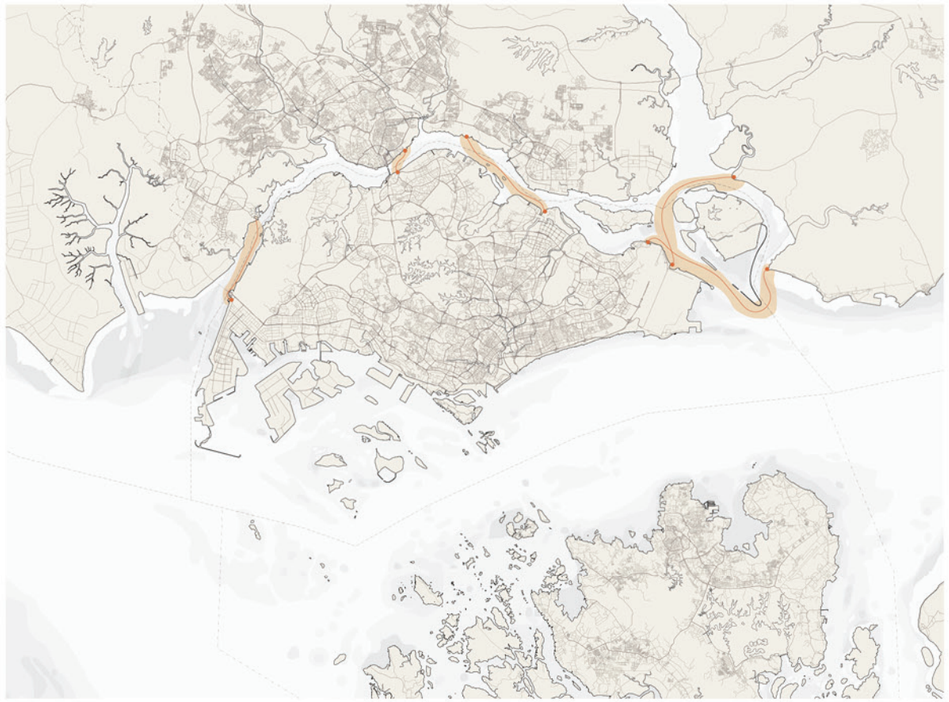
Left:
Regional map showing a redefined network of increases accessibility in rural areas

Right:
Case study showing possible routes for increased public transportation

Network of Increased Accessibility

The more than 1000 islands of the Riau, many of which are home to kampongs, have few or nonexistent ferry connections. This project aims to reduce the isolation of these island communities by improving their connection to the region.

Until now, the government has implemented a few public transportation routes, which we call “water buses,” that are either subsidised or operated on concession. In general, this concept works, but it is only a starting point: a small number of kampungs have been impacted so far; the frequency of stops is still quite low; and the maximum number of trips is only six per week. Our project proposes to increase the number of routes significantly, and by connecting them to local transport hubs as described above, to create a viable multi- level sea transportation network.



Connecting the Johor Strait

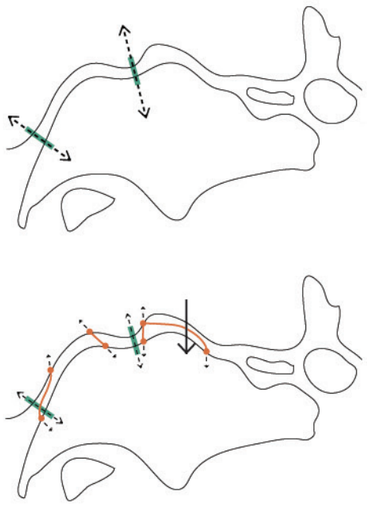
- Publicly accessible coastline
- Coastline route and terminal
- Railway and MRT

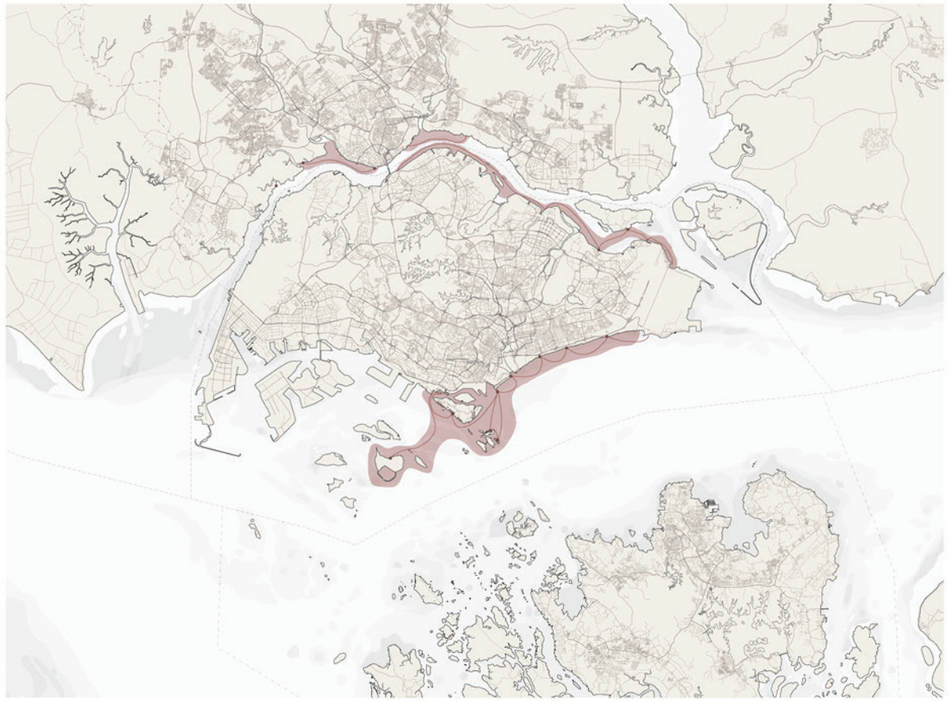
Left:
Regional map showing possible alternatives to the Causeway and Second Link for crossing the Johor Strait

Right:
The map shows the Johor Strait. The places where the coastline is accessible are indicated.

Sea Transport as an Alternative

An estimated 90 million people cross the Strait of Johor over the Causeway and Second Link, the only two land connections between Johor and Singapore. Our analysis revealed that traffic jams and inefficiencies in the border crossing procedure is highly inefficient and can take hours. Because of their geographic proximity, we propose a sea-based alternative to connect Singapore and Johor. Ferries will shuttle passengers across the Johor Strait at key points of interest on either side. As a first step, we propose connecting the existing ferry terminals with the three new MRT stations now under construction near the shore; a second phase would incorporate a large network of transport modes. Our idea is that better connectivity will unite the two cities and positively impact them both.



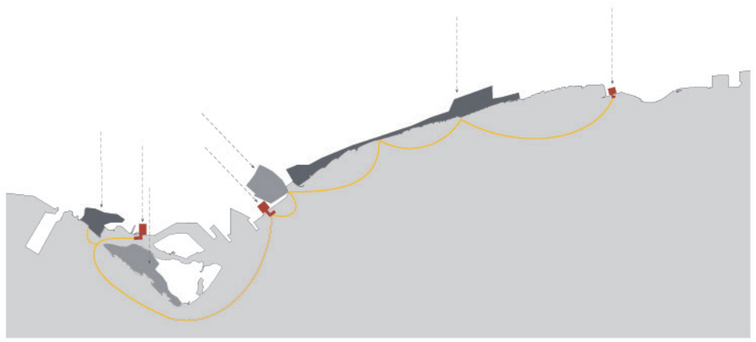


Left:
Regional map showing a proposal to reconnect the coastline

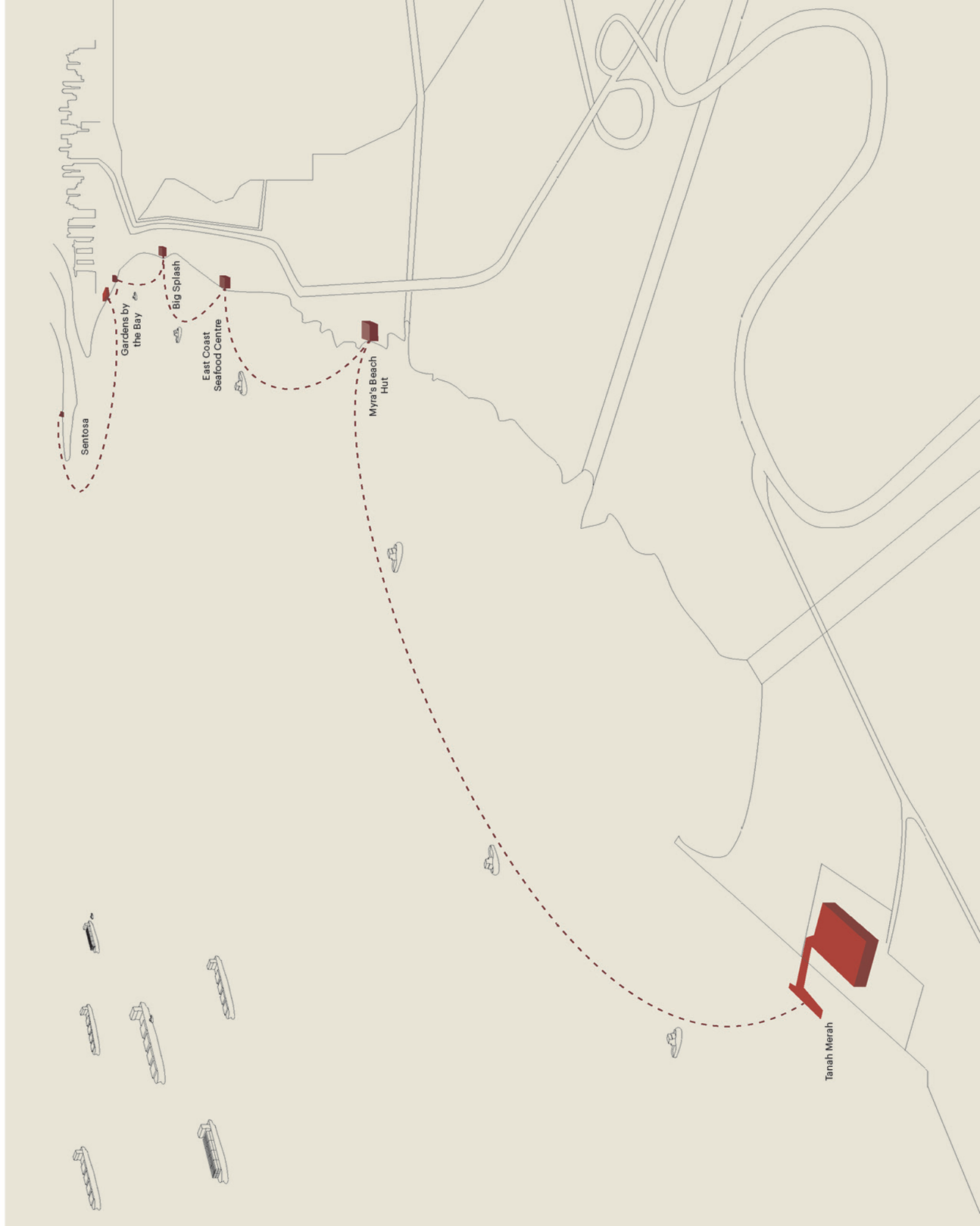
Right:
Perspective along the south east coastline from Tanah Merah to Sentosa

Hop-on-Hop-of Along the Coastline

This map shows the points on the coastline, which are currently accessible to the public. In Singapore this number is exceptionally low, around 7.5%. The situation in Batam and Johor is not much different. In interviews with residents from around the region, we gathered that there was a general desire to change this. We believe there are opportunities to revitalize these remaining publicly accessible parts of the coastline. Drawing from the long history of boat travel around this archipelagic region, we will introduce a boat service that regularly stops at certain points of interest along the coast. Our goal is to implement a connection designed for leisure and experience, so that people can reconnect with the sea and their sea heritage.



New connection of Singapore's South East Coastline



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In memory of Benjamin's drowned iPhone.