Detail of the stairs to the deck of a vessel in the Strait of Singapore

A bulker carrier in the Strait of Singapore

A view of the Straits from aboard a ship

View from Batam of the Strait with Singapore in the background

Architecture of Territory
ETH Zurich
FCL Future Cities Laboratory

Sea Region
Singapore, Indonesia, Malaysia
Project 2

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SEA URBANISM

Towards a Public Sea Space

by
Panos Coucopoulos
Alessio De Gottardi

Ships, fairways and anchorages

Boundaries of many forms and functions – territorial, geographical, mental – circumscribe the identity of a territory that remains in limbo: the Singapore Strait. Gaps in social, economical, demographic, and cultural characteristics constitute the complex and hard-to-define boundaries in the trinational region. These intangible gaps are echoed in the architectures of formal territorial demarcations along the Singapore Strait and the region's coastal areas. At the same time, shared interests in investment opportunities, flows of goods, necessity of resources, and in sovereign identities, anchor the three sides together in a cross-border geopolitical form – a 'triangle' - of questionable stability and balance.

The project Sea Urbanism tackles the problem of redefining the identity of the Singapore Strait. Instead of the Strait seen as the industrialized borderzone territory, and a geographical and mental margin, the project asks how could the sea of the Strait become a public space? Who could benefit and in what ways from being out on the sea? The value of living at and being close to the water has inspired the proposal for a new zone of maritime public uses within the Singapore Strait, which opens up in-between the existing shipping lanes and the security systems. Specific areas have been selected for different functions, to enable exchange within this new zone among the seafarers, locals and tourists, supported by an extended network of public sea transport. The reinvention of the public sea space, which breaks existing barriers and bridges gaps, invites a reflection on the rigid planning and political approaches to the cross-border relationships within the metropolis, and speaks of an opportunity and a necessity of envisioning the Singapore Strait as the space of common future among the three countries.

Grammar of (Dis-) Engagement

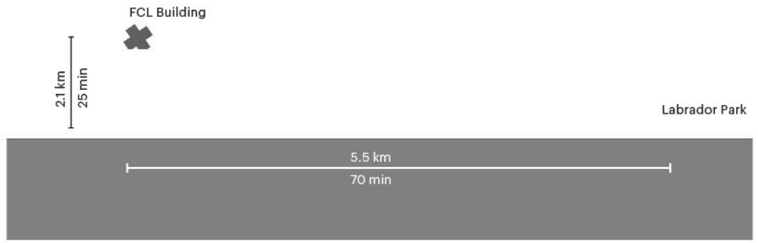
Unlocking the potential of a territory implies understanding and grasping the relation of given territory to its surroundings, as well as to its inhabitants. In our study of the Singapore Strait as an urban territory, the first step was to comprehend how the local populations relate to their territory. Given the geographical proximity to the sea, we initially considered the relationships to the sea to be representative of land-maritime interactions, only to be surprised by our later findings.

View of Telok Blangah Road in Singapore where the former coastline was situated before the land reclamation process.

Shifting Perceptions

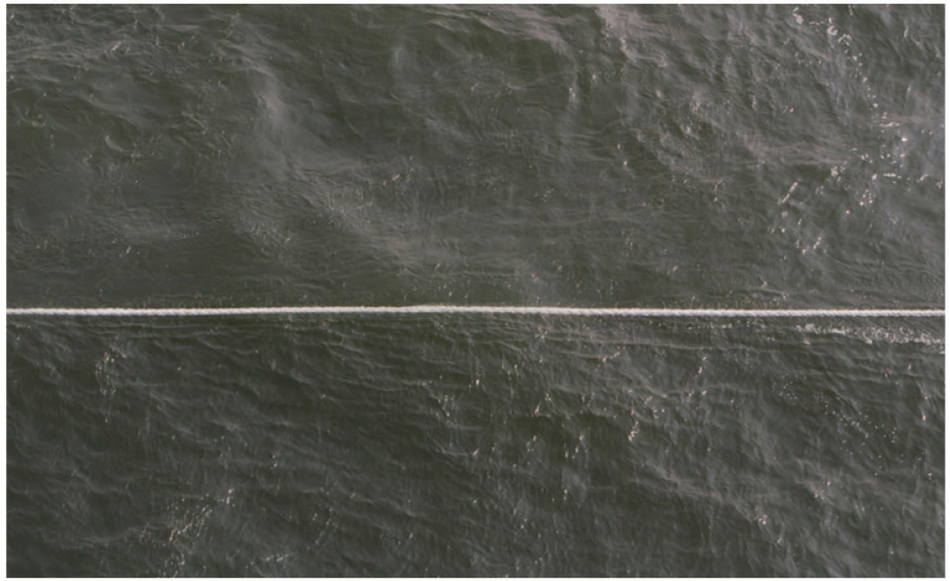
Lying one degree north of the equator and a small strait south of Johor Bahru is the lozenge-shaped island of Singapore. It is considered both the southern-most city of the Malay Peninsula and the northernmost island in Indonesia's Riau Archipelago.

A common sea unites the three territories into one bigger territorial entity; however, the same sea also divides them.



Inaccessible Seafront

Despite its island geography, Singapore has a noticeable disconnection from the sea. One of our first urges when confronted with this topic was to qualitatively and quantitatively calculate the time and distance necessary to reach the shoreline from our base at CREATE on the NUS Campus. After reaching the coast, another 70 minutes and 5.5km of walking was necessary to reach the sea.



Drift (Rope Sketch), Charles Lim, Sea State, 10 min video, 2012

Fear and Distance

As eloquently presented in the works of Charles Lim, Singapore's relation to the sea is one of a voluntary nullification and deprecation.

A 2011 advertisement of the Singapore Navy reads: 'We all take the sea for granted. But that wouldn't be possible without the advanced naval technology that is deployed around our shores. Take the multifunctional radar that is installed on our frigates. Conventional radar can only help with surveillance. Multifunction radar also controls the Aster anti-missile system and helps target aircraft and low-flying missiles. In combat, when every second counts, it makes all the difference. But what's the best thing about this radar? It makes sure you don't even have to think about the sea. Ever.'

Hanis, 26, female, Singapore

'I learned to swim 3 years ago, but most of my friends don't swim as well.

I go to East Coast Park for the cafeterias and to Sentosa on Sundays for the beach, but I don't swim. Why would I bring you to a beach if there's no food or café there?'

As David Teh comments in regards to the above text: 'The sea is a horizon of unspecified threats, a domain of unquiet souls. And the promise of the state is not its conquest, but its negation. (You don't even have to think about the sea. Ever.) The repressed idea of the sea, if not its image, belongs to the prophylactic complex that guards a matrix of drip-fed, suburban xenophobia.'

Singapore is out rightly dependent on ships and the sea, yet their presence has been cast away from the city and hidden behind the gated container parks of the logistics zones.

In our own personal experience, a 45-minute walk along the streets parallel to the coastline in the Clementi area yielded no access to the seacoast.

Artificial beach,
Johor Bahru (Malaysia),
2014

Prestige

In the case of Johor Bahru, Malaysia, the relation to the sea is a platonic one.

'The beach has a special expensive type of sand that comes from Sabah {region in Malaysia}. It is not allowed to swim here', were the words of an employee at Danga Bay Development in Johor Bahru, during the presentation of the project.

Here the connection with the sea 'has been reduced to leisure, to the ownership of views, the phantasmatic enjoyment of 'lifestyle'', as anthropologist Michael Taussig describes it.

High levels of pollution coupled with the stark political context of the destructive presence of the Causeway have marked the collective perception of the sea. Yet, recently imported investments are revamping that perception and transforming it into a well sought out commodity.

Komag, 25, male, student at UTM
'We are not capable of swimming. Maybe only 20%, or less, of Malays swim. It depends on the family; if the father can swim, he will teach his children.'

1.

1.
Kampung in Batam

2.
Kampung in Bintan

3.
Stranded garbage at a kampung in Bintan

Our Yard, the Sea

The presence of the sea in the Riau Archipelago is regulated by more practical relationships. The sea acts as the intermediary between fishing, transport, commerce, and housing.

Appropriated and utilized in the daily life of the locals, the sea is indispensable to the organization of these communities but evinces no romanticized social values. It strongly affirms the concept of a means to an end thus deliberating it from any collective prohibition in regards to its use (view photo 3). Therefore, a sort of inertia governs the relation of the population towards this commodity.

Bayu, 27, male, Bintan
'I don't swim. In my family only my aunt can swim.'

2.

3.

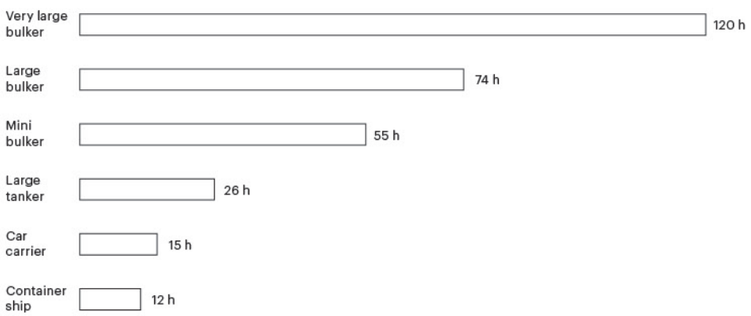
The Sea as Another Urban Territory

Seaport cities like Singapore have witnessed drastic evolution and transformations in their waterfront redevelopment.
Over time, the port functions and infrastructures changed dramatically, and with them the place of the port in the urban fabric of the city.
The port's human element has been reduced by technological advancements and automation in maritime and trade logistics. Its interaction with the city has been reduced by expanding infrastructure, such that the city has gradually retreated from the active waterfront.

Map showing the density
of vessels on the
Singapore Strait from
14.10.2014 - 09.11.2014

Sea Users

Our search to understand the urbanized territory of the Strait began by trying to discern and quantify the various users. This helped us understand the main functions that take place within the Strait and ultimately realize the strong polarization of uses comprising this heavily rationalized and trafficked territory.

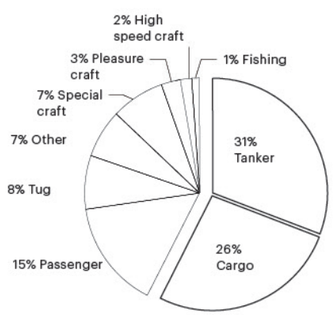


Time Spent in Port

According to the ICC International Maritime Bureau, each type of vessel requires different loading and unloading times. Because bulk cargo is so difficult to discharge, bulkers spend more time in port than other ships. A study of mini-bulkers found that it takes, on average, twice as much time to unload a ship as it does to load it.

Intense Port Movement

A third of the world's shipping moves through the Strait of Malacca and Singapore Strait each year, including most trade between Europe and China, and nearly all the crude oil that moves from the Persian Gulf to the big Asian economies like China, Japan and South Korea. There are about 1,000 vessels in port at any one time, with a new vessel arriving every 2-3 minutes. About 130,000 vessels arrive in Singapore each year alone, according to both Singaporean and international estimates. That breaks down to about four ships entering the Strait every minute.



A Polarized Clientele

'Logistics is the management of the flow of goods between the point of origin and the point of consumption in order to meet some requirements, of customers or corporations.'

More than 70% of all vessels crossing through or across the Strait are related to the transport of goods and commodities. The Strait provides the deep water passage to the Port of Singapore, one of the five busiest ports worldwide.

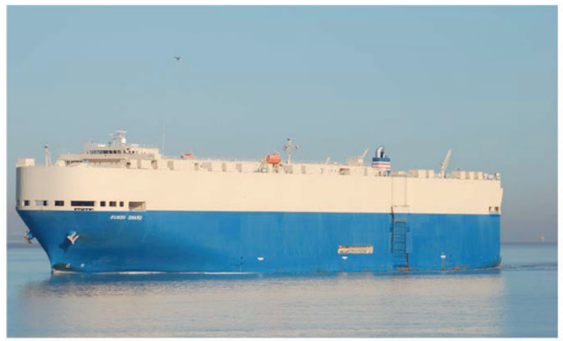
Goods are exchanged both on land and on water, either while stationary or underway, through an operation called ship-to-ship transfer.

Piracy on Cargo Vessels

There were 125 pirate attacks reported in the region in 2013, triple the number from 2009. (Over the same period, attacks off the Horn of Africa shrank from 197 to 13.) Half of the world's attacks now take place in the waters off Indonesia, Singapore and Malaysia. Pirates of southern Asia are mainly in the business of stealing cargos of liquid fuel.


CS PIONEER


MAERSK LINE




MAERSK LINE


FALCON 3


M.T.S.V


PT16
COAST GUARD

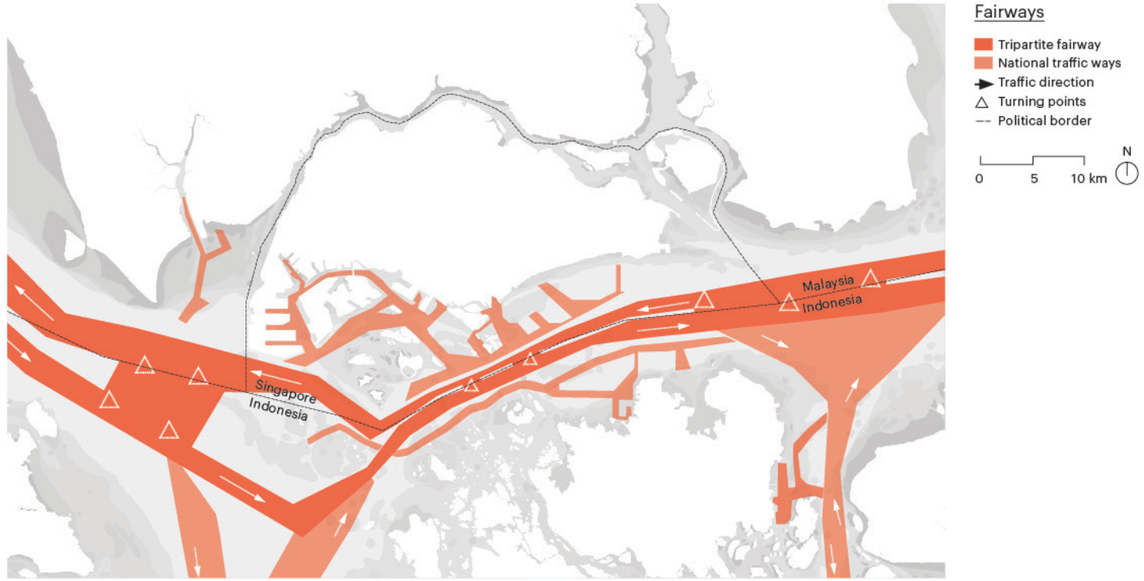
Revealing the Seaway Code

International and national laws and legislations that precisely regulate the movement of vessels within the different jurisdictions govern the heavily trafficked Straits. Similar to land-based transport networks, sea transport is comprised of traffic corridors, primary and secondary traffic lanes, anchoring zones and defined maneuver zones.

Vessels have the liberty to cross international waters without requesting permission but by only reporting to the respective authority; to cross national waters, however, permission is mandatory.

This highly planned and monitored territory supports political borders and boundaries that interact with the presence of the sea fairways and define the relationship between the neighboring countries.

Seaway traffic in the Strait



A Rigorous Circulation Pattern

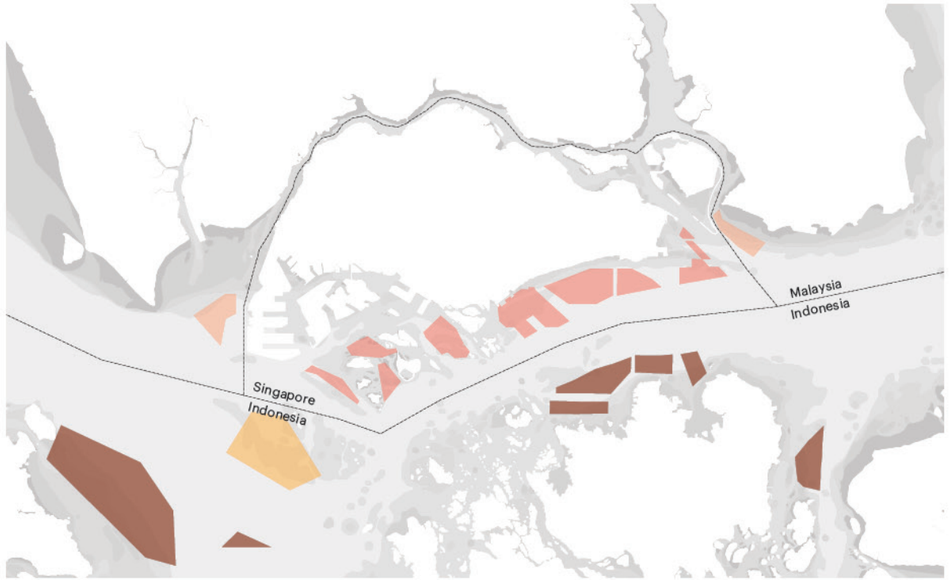
According to international maritime regulations, bigger vessels are obliged to give the right-of-way to smaller ones when in contact. Sea fairways in the Strait are clearly divided into two mono-directional lanes that facilitate the organization and flow of crossing vessels.

Vessels with overall internal volume of 300 GT and above or with a length of 50m and above are obliged to follow the defined fairways.

Controlled Manoeuvering

International zones are no anchorage and no fishing zones. The control of these zones falls into the hands of the marine authority, the coast guard, maritime enforcement agency, marine police and the department of fishery of each respective country.

The danger triangle zones, the so-called 'Yellow Boxes', function like imaginary traffic light intersections. They are principally turning points. These intersections are controlled and supervised by the respective national authorities to which the national waters belong. While in the Yellow Box, the vessel is permanently in contact with the authorities on mainland, which help steer it through.



Anchorages
Singapore
Indonesia
Malaysia
Nipah zone
Political border
0 5 10 km
N

Transient Parking Zones

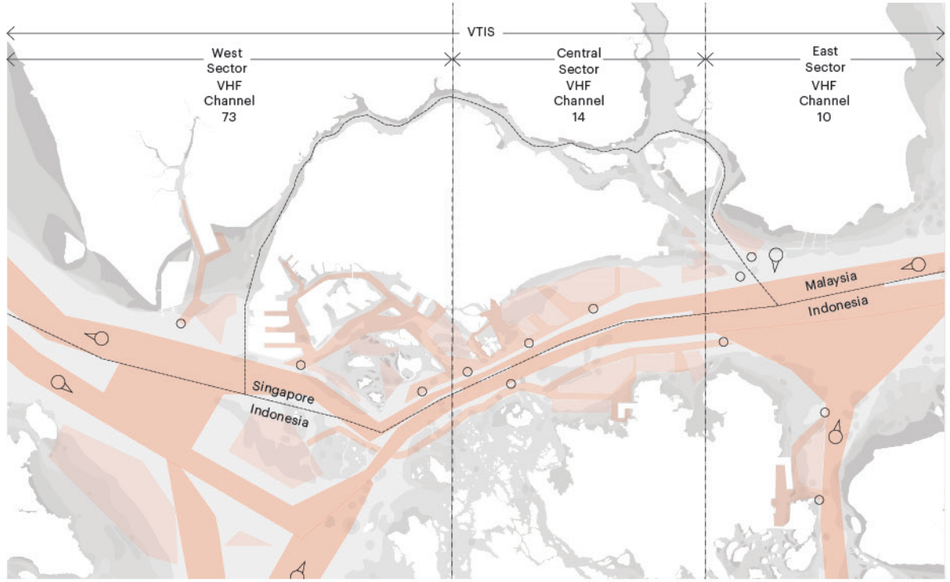
Anchoring for vessels, much like car parks, is paid by the minute. The anchoring timer starts the moment the anchor is dropped until it is lifted from the sea bottom. The fare is calculated by multiplying the vessel's unladen weight with the cost per ton. Minimum calculated weight is 20 tons. Fares are based on international agreements; therefore do not vary between the different countries. Vessels book their anchoring before arriving through an independent marine agent.
The purpose of anchoring must be reported to the authorities beforehand. Three are the main reasons for which vessels anchor outside the port: (i) the port is full, (ii) the ship is broken or (iii) it is waiting to enter the docks. Therefore, anchoring zones are basically transient waiting zones.

Nipah Transient Anchorage Area NTAA

This free-of-charge anchorage area is conveniently located in international waters very near the Singapore waters. With a seabed that suits ship-to-ship operations, lay-ups and other marine activities, it is an established choice for vessel operators.

A Competitive Market

Bunkering and supply costs vary greatly between the three countries surrounding the Strait. It is not uncommon practice today for vessels to load their cargo in Singapore and then move to Indonesian waters in order to cover their supply or bunkering needs at a much lower cost. The infrastructure of these cheaper alternatives is not as competitive or well organized as Singapore.



VTIS Zones
Political border
Pilot boarding point
Reporting point
0 5 10 km
N

A Safe Passage

The Malacca and Singapore Straits are divided into Vessel Traffic Information System (VTIS) Sectors, three of which are in Singaporean territory. A mandatory ship-reporting system, known as STRAITREP, was developed in 1998 between Indonesia, Malaysia, and Singapore as a tripartite agreement for safer passage through the Straits. The system was developed to promote safety of navigation, to protect the marine environment and to facilitate the movement of vessels within the Straits.

Vessels with overall internal volume of 300 gross tonnage and above or with a length of 50m and above are required to announce their arrival a minimum of twelve hours before arrival and once approaching a Sector. Vessels carrying hazardous or noxious cargo on board are required to notify the local authorities 24 hours prior to their arrival. All passenger vessels with a VHF are also obliged to report their arrival.
Vessels must communicate their speed, size, direction, defects or other potential threats, number of people on board and the presence of hazardous cargo before entering the traffic corridor.

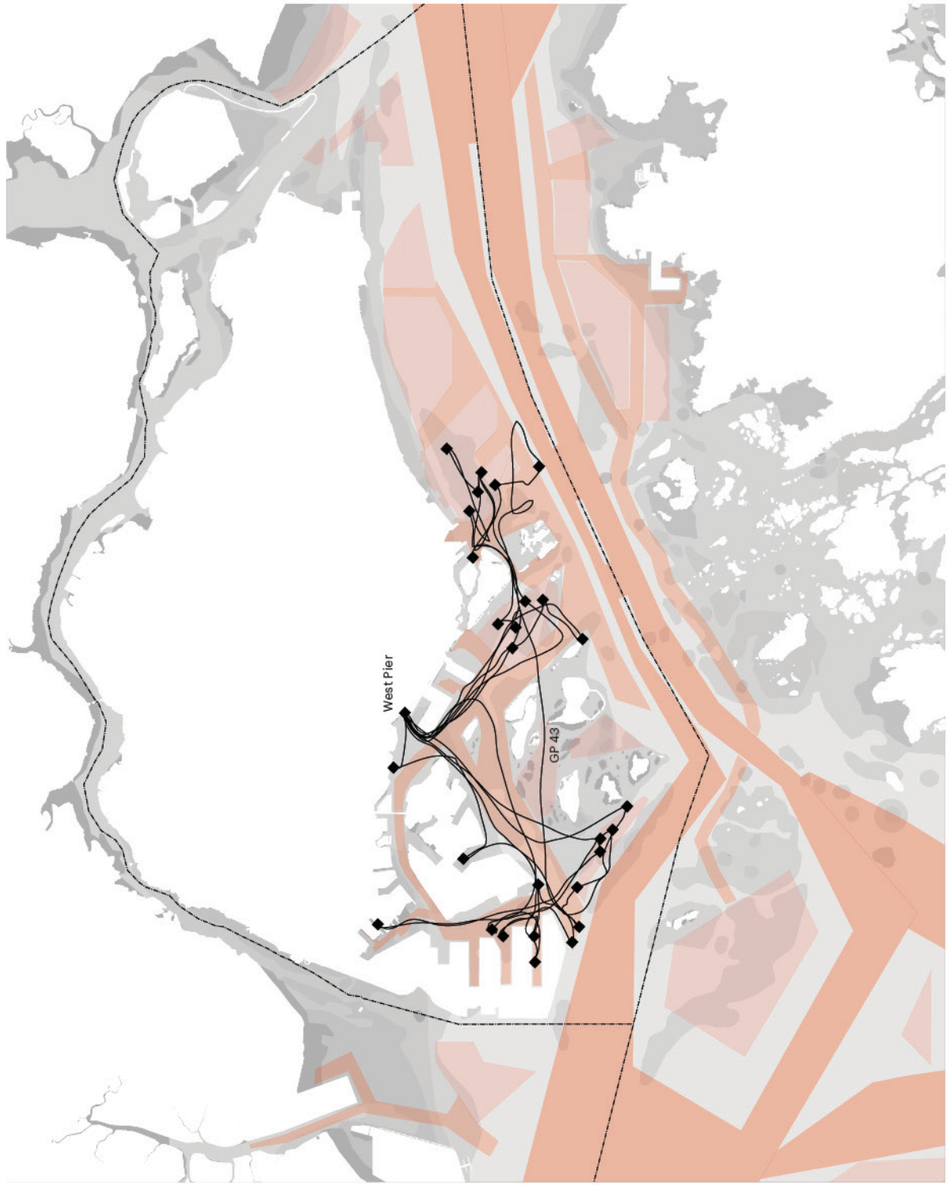
Steering in the Yellow Boxes is also accomplished with the use of the VTIS system. It is further used at the Pilot Boarding Points, where pilots employed by the local authority are boarded on the vessel entering the port to help steer it to the pier. This is a common practice at many ports that ensures the safe docking of the ship, as local pilots are familiar with the seabed, coordinate easier with the local MPA and can safely execute all necessary manoeuvers.

Sea Traffic

Sea traffic is regulated by a combination of laws similar to land-based traffic laws and informal, user-made rules. Compliance to this combined rule systems and a set of strict time grids guide the complex traffic through the Strait.

From Malaccamax supertankers ploughing miles after miles of endless blue from port to port to the smaller more agile Indonesian panchungs buzzing around them, the variety of users and purposes is endless. Our study focused on three case studies in order to get an overall picture of how these actors form the territory.

A bulk carrier vessel crossing the Strait

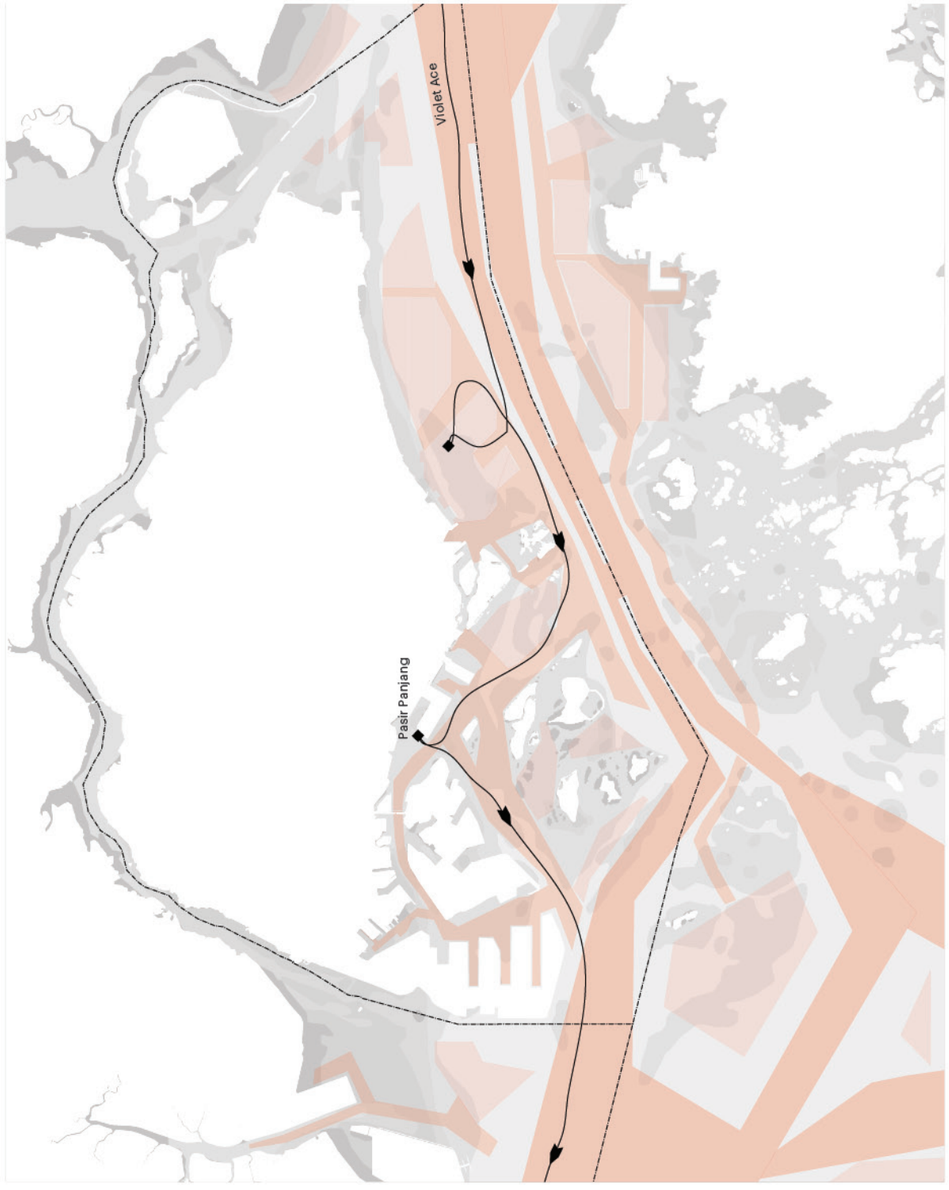


Connecting Land to Anchorages

The map traces the activity of a passenger vessel, based in West Pier Singapore, on October 27, 2014. It is used for pilot boarding and to bring crew members back and forth from the anchored ships to immigration control.. This vessel type is not permitted to cross national borders.

Crew Supply Vessel

Name:	GP 43
Ship Type:	Passenger
Flag:	Singapore
Dimension:	15 m x 4 m
Draught:	1.4 m

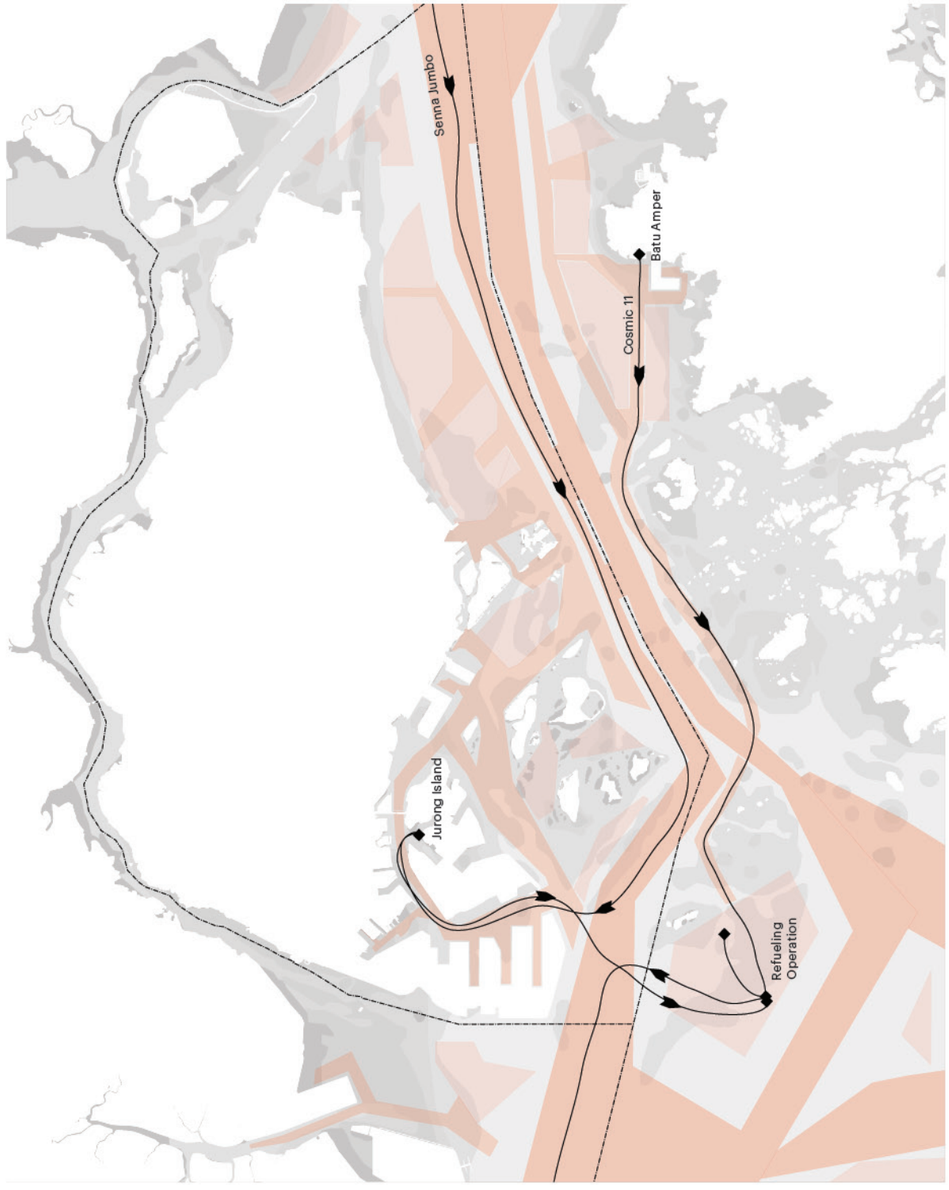


Crossing Through

In this case, a vehicle carrier arriving from Korea required two days to cross the Strait. After waiting at the anchorage zone for about 8 hours until a berth was made available, the vessel moored at Pasir Panjang terminal where it loaded and unloaded cargo before continuing its voyage towards India.

Vehicle Carrier Vessel

Name:	VIOLET ACE
Ship Type:	Cargo
Flag:	Bahamas
Dimension:	189.3 m x 32.3 m
Draught:	8.8 m



Each Location a Distinct Purpose

This LPG tanker from China, after loading/unloading its cargo at Jurong, left the Singapore national waters and crossed to Indonesian waters, where it was refueled by a local fuel supply vessel in the free NTAA Nipah zone. Vessels, due to bunkering supplies being more economic in Indonesia, often repeat this.

Fuel Supply Vessel / LPG Tanker Vessel

Name:	COSMIC 11 / SENNA JUMBO
Ship Type:	Tanker / Tanker
Flag:	Indonesia / 3.6 m / 6.6 m Thailand
Dimension:	69.95 m x 10.7 m / 224 m x 36 m
Draught:	3.6 m / 6.6 m

A Cargo-Focused Transport Landscape

The word 'traffic' comes from an Old Italian word meaning, 'trade'. Centuries later, the busy Strait is a vibrant testimony to the continuity of language. The signs of a territory developed around the transport of goods dominate the sea: available infrastructure, the density of freight-related vessels crossing the Strait, and the revenue generated from shipping. On another note, transport of people by sea is comparatively minor and constrained to a much smaller scale and common interest. This is directly related to questions of political and sovereign context as well as the orchestrated effort of the previous decades to cultivate a sovereign identity for Singapore. International agreements further promote the ease of exchange of goods to the disadvantage of exchange of people.

Loading and unloading of container vessels at the Tanjung Pelepas port

Scars and Connectors

Today, the coast of Singapore is lined with berths designated for the mooring of cargo vessels and other freight transport vessels. Development plans from the building authorities of Malaysia and the Riau Islands Province indicate similar trade-oriented strategies.

Passenger ferry terminals, however, remain few in number and significantly outdated in infrastructure when compared to the investments and renewing policy of cargo terminals.

Cargo Landing Points

Political border
Berth

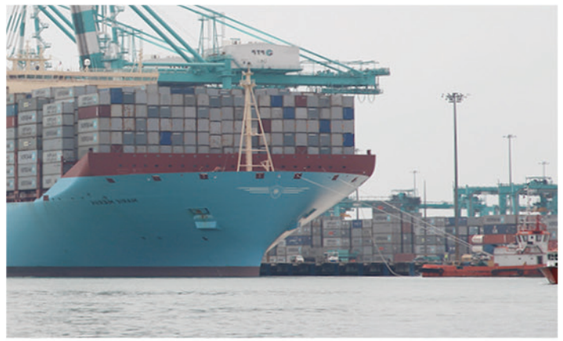
0 5 10 km N

Passenger Landing Points (Ferry Terminals)

Political border
Ferry paths
Ferry terminals

0 5 10 km N

Vessels in the Singapore Strait

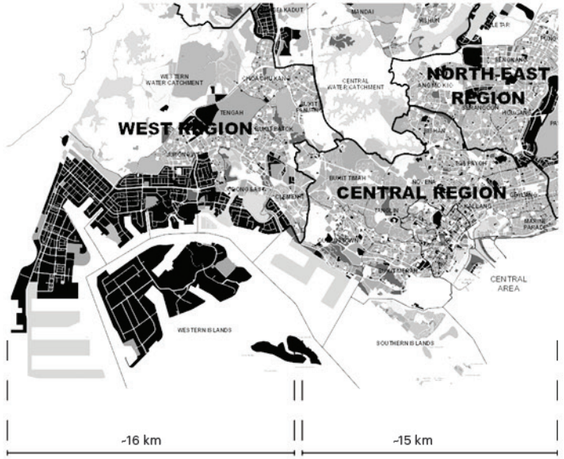


Vessels and marine infrastructure in the Singapore Strait

The Port (and the) City

The invention of the standardized cargo container in the mid-1950s radically transformed the space and time of port cities. What was once a vibrant, multilingual environment of seafarers, fishermen, dockers, sailor bars, flophouses and brothels is now substituted by vast anonymous tracts of land necessary for the storage and storing of the containers.

As automatization and maximal efficiency penetrated the very core of maritime trading the old waterfront culture was rendered obsolete and faded gradually. This change had a great impact on the relation to the city. Time witnessed the port city evolve into two strongly independent entities: the port and the city.



Tanjong Pagar Terminal

From a trading post for the British East India Company close to two centuries ago, the port of Singapore has evolved to handling over 60,000 containers per day. In 2027, the lease on the city terminals expires. The port that played a vast role in transforming Singapore to the successful island nation it is today, will move westwards to Tuas. This will free waterfront land close to the city to be developed.

This move and further dissociation from the city manifests a global trend of ports becoming evermore autonomous. As the port ceases to be a centrality in the city, the city pushes away from it. Moreover, as ships transform into super-ships, the port necessitates more space and infrastructure, obtaining dimensions comparable to the size of the city.

These changes yield political decisions which translate into territorial manifestations and are reflected in the planning process of the Urban Redevelopment Authority in the Master Plan 2014: the once integrated port is now a mono-functional zone in the outskirts of the city.

Above left:
Map of Singapore, 1914

Above right:
Master Plan 2014, URA

Below left:
Until 1960, Tanjong Pagar Terminal

Below right:
After 1960, Tanjong Pagar Terminal re-developed

1920

260'000 tons
Cargo storage capacity

5'764
Port calls

11'000
Employees

1955

17'000'000 tons
Cargo storage capacity

8'030
Port calls

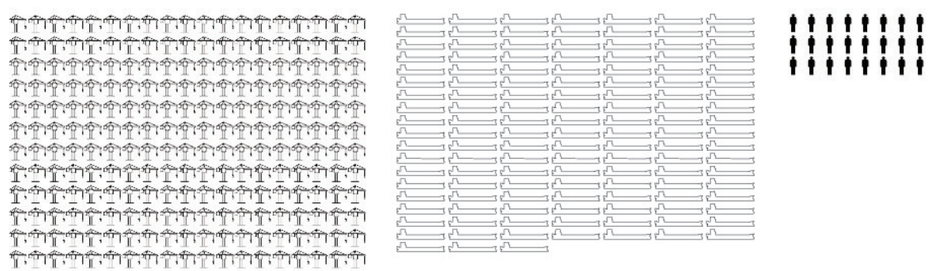
6'300
Employees

2014

471'400'000 tons
Cargo storage capacity

130'000
Port calls

5'650
Employees



More Goods, Less People

The Port of Singapore, one of the five busiest ports in the world, is a major transshipment hub, the world's biggest bunkering hub, and ranks in the top five positions in terms of containerized traffic handled. Yet, albeit an increase of 1800% in terms of expansion in the last century, the amount of workforce has decreased by 50%.

This depletion of workers, a direct result of automation and technological advancement, reflects the shifting relation of the port to the city. The relationship between the port and the city is evermore diminished.

1955

2014

2030

Ports

Cargo terminals
Industrial ports

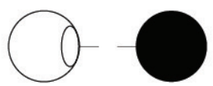
Expansion of port infrastructure sites and facilities through the years

Primitive port/city
Until 1800s

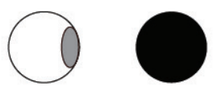
Expanding port/city
1800 - 1900s

Modern industrial port/city
1900 - 1950s

Retreat from the waterfront
1960s - 1980s



Redevelopment of the waterfront
1970s - 1990s



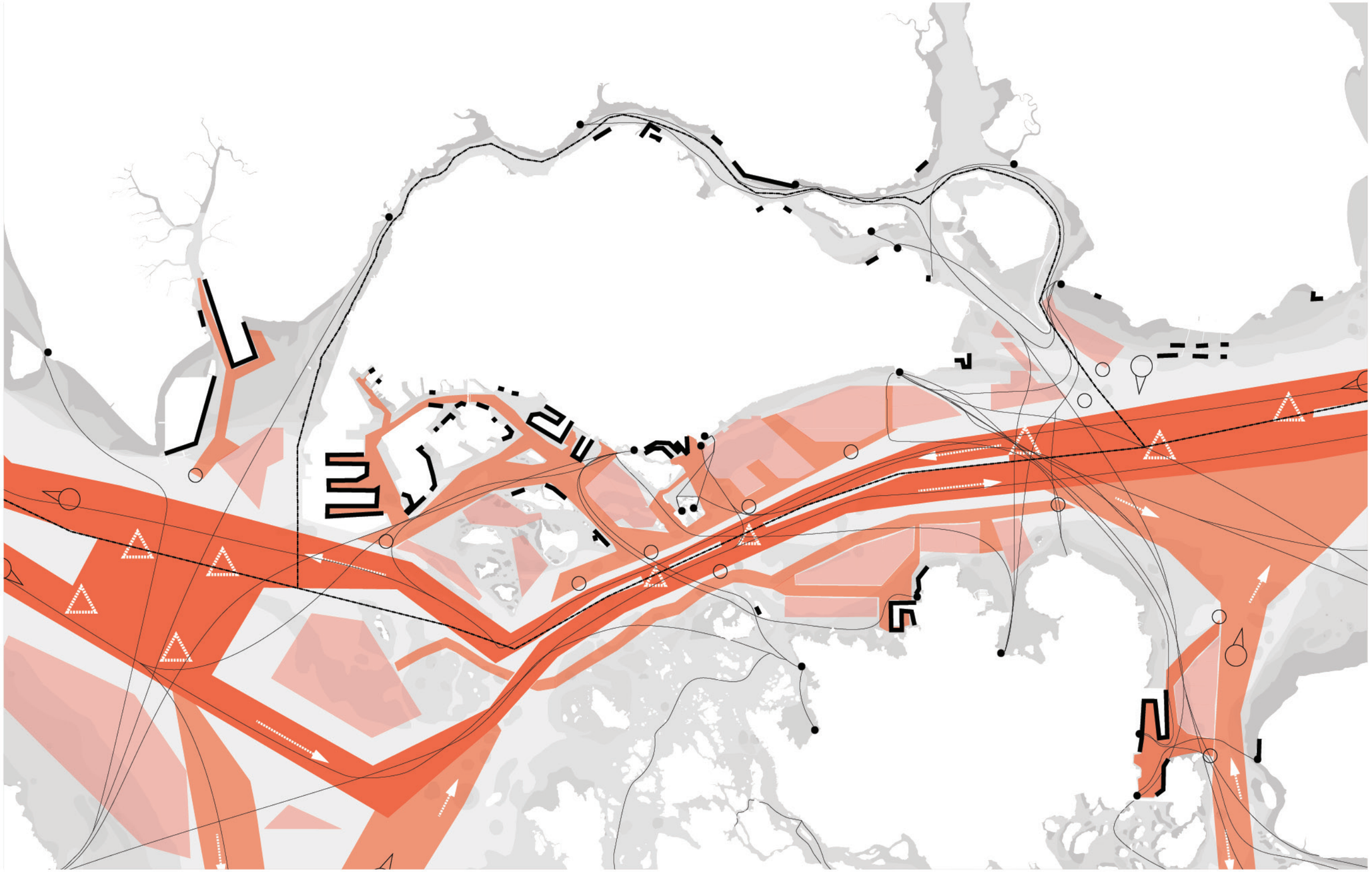
A Receding Port/City Relation

As a result of evolution and changes in maritime trade handling functions, land-maritime interrelationships have shaped the port-city interface and directly impacted the waterfront development of cities. The early featured close spatial and functional association with the city. In their efforts to accommodate oil-refining and container terminals, large-scale contemporary ports have increased capacity, at the expense of urbanity.

Sprawling Ports

Through an extensive land reclamation process, the city of Singapore has and is continuously expanding its port infrastructure towards the sea. Once directly connected to the bustling city centre, Keppel Harbour has been abandoned in favour of areas more remote and secluded from the flows and activities of the city.

Economic benefits and fiscal projections are primary concerns in the future development planning strategies of Singapore's neighbors. Both Malaysia and Indonesia are constructing and expanding existing port facilities around the Strait. As a major international passage for maritime handling, this 16-kilometer wide strait attracts the interest of global maritime investments.



An Urbanized Vocabulary

At first glance, studying a sea territory seems to require a different approach than the study of land-based territories. Our investigation revealed that the vocabulary to describe the Strait is similar to those familiar to land-based conditions.

Sea Transport

- Fairway
- Trafficway
- Anchorage
- Traffic direction
- Political border
- Berth
- Reporting point
- Ferry paths
- Ferry terminals
- Pilot boarding point

0 2.5 5 km

N

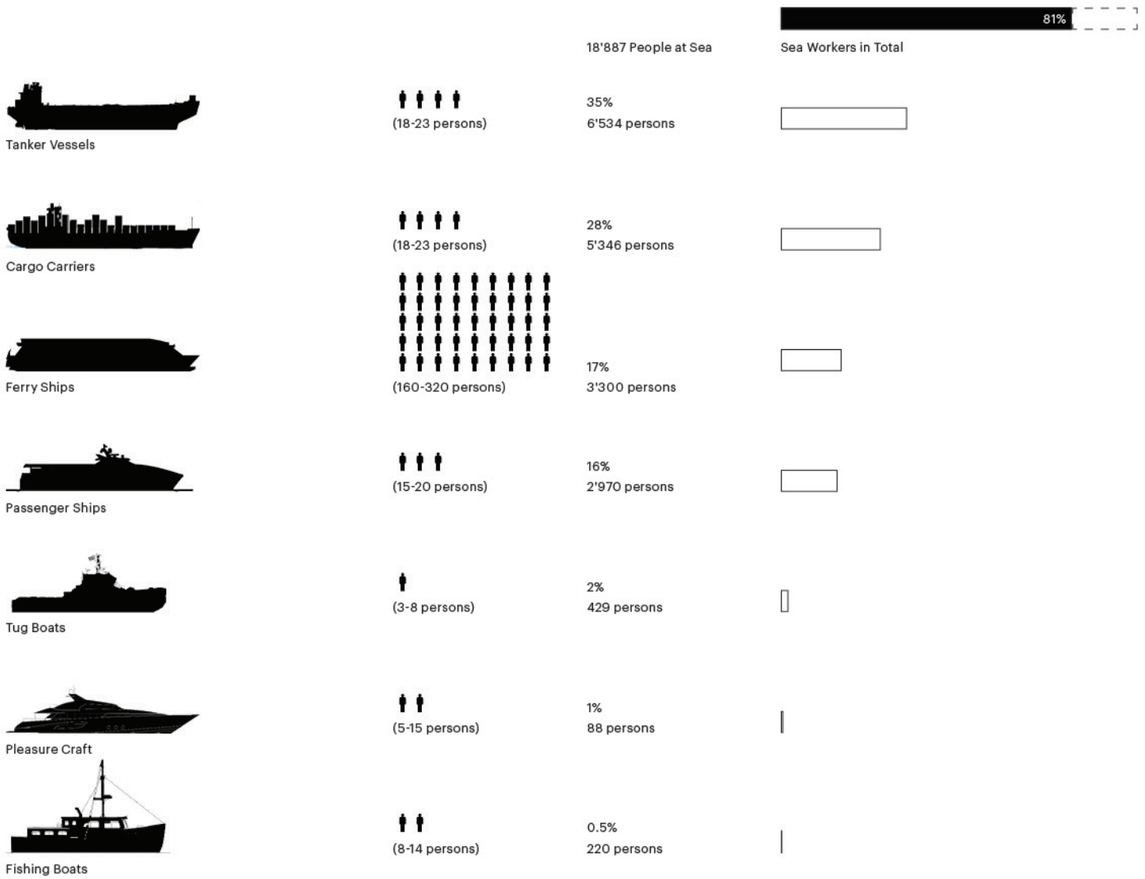
Men and the Sea

Foreign visitors, migrants, seamen, stevedores, dockworkers, longshoremen: all vivid, multicultural individuals that transformed the image of ports into a condensed small piece of the world. The port city was a condensed urban manifestation of globalized connections. Today, as relationships between ports and cities are steadily fading, and machines replace dockworkers, what is left of this thalassic world? Which populations still interact with this saltwater world and what remains of their connection to the city?

Map showing the presence of vessels in the Strait on 30.10.2014

People in Motion

After an analysis of the vessel traffic within the Strait, the next step was to understand the principal populations that move around this territory. These transient populations temporarily occupy the space before moving onto their next destination. This dynamic workforce circulates on different frequency patterns.

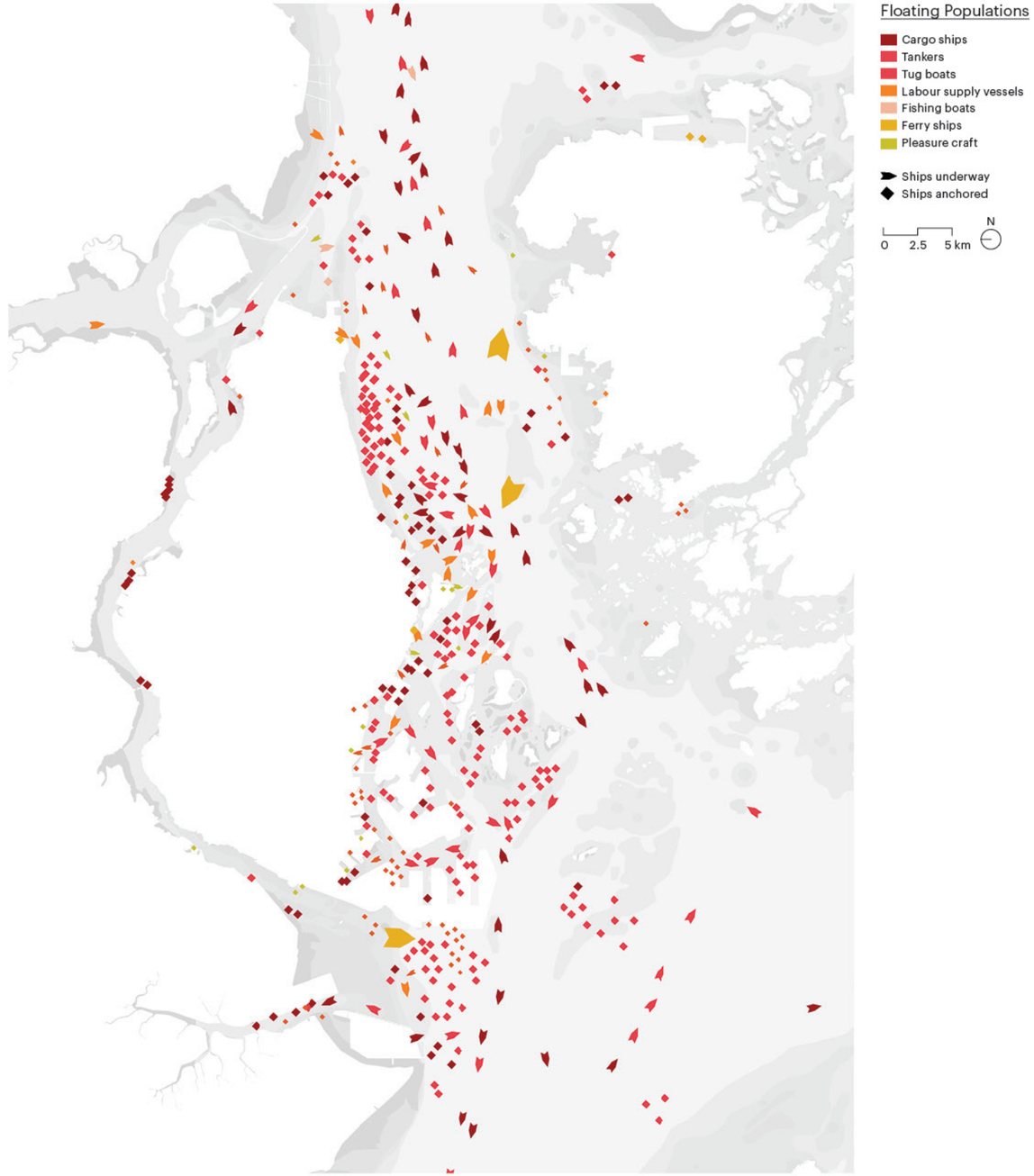


Shifting Populations

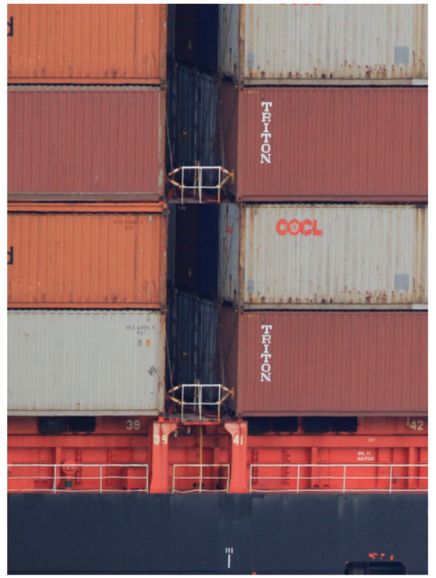
They are passengers aboard vessels crossing through or temporarily anchored within the limits of the Strait, from seafarers, to ferry passengers, cruise ship passengers, to workers providing land-to-sea services.

What distinguishes these groups is the brevity of occupancy. This bulk of population is always present but is in a continuous flow, shifting by the minute with the entry and exit of each ship.

Those aboard tanker vessels and cargo carriers make up 63% of this sea-based population. The large size of their ships, compared to the small number of crew, means that live in extremely low-density conditions. Passenger ships with higher densities are fewer in number and have lower circulation frequencies through the Strait.



Fishermen in the Strait, Singapore



Pilot boarding near the Port of Singapore, Singapore

Workers at Sea

Two basic groups comprise the biggest portion of workers at sea: local sailors and deep-sea mariners. The first are contracted employees who sail out for a couple of weeks at a time from a given port. The latter are hired for one or more voyages that extend for several months at a time.

Living on the margins of society, professional mariners are the transient population par excellence. They travel from port to port without ever resting at one port for any more than a few days, which is the time necessary for their vessel to be loaded/unloaded or repaired. With the quick turnaround of modern ships, spending only a matter of hours in port, a seafarer's free time ashore is drastically limited. Once ashore, seafarers seek the pleasures they are deprived of on board.

Ebadach, 23, Mechanic, India
4 Hours in Singapore

'I rest just 4 hours in the transit room, while waiting for the plane. I don't want to visit Singapore. It's too much chaos for me.'

Rahii, 32, Engine Officer, Indonesia
1 Night in Singapore

'The container ship is unloading right now. I have one night to spend here: I will meet some friends and have fun.'

Yoga, 48, Captain, Malaysia
4 Days in Singapore

'I took a room here at the Singapore Marine Club. My ship has to be repaired because of a problem of the navigation equipment. So I asked my wife to fly in from Malaysia for 4 days. We will visit the city.'

Shipping: Crew vs Revenue

Passengers :	2 Million per year (20 crew members/vessel)
Port Calls :	130'000 per year
Revenue for Singapore :	20 Billion SGD per year (7% of GDP)
Revenue per Ship :	153'846 SGD

Transient Population

'She tortures me but I couldn't live without her', were the words of an Indonesian deep-sea mariner when referring to his 'home', the sea. Seafarers have a particular relation to both the sea and the land. They could live for months at a time in either one, based on job availability and the request of the market, but their stay is always temporary. Their relation to the city is of the same quality. When they arrive in port, they only have a few hours to spend in the respective city. They tend to strategize their time according to need: shopping for supplies, resting, and socializing. Sightseeing and tourism are secondary.

1.

2.

3.

4.

1.
Arriving at the Pier

2.
Waiting zone and immigration

3.
Seafarer waiting to be transported to the city

4.
Seafarers waiting to embark

Disconnected from the City

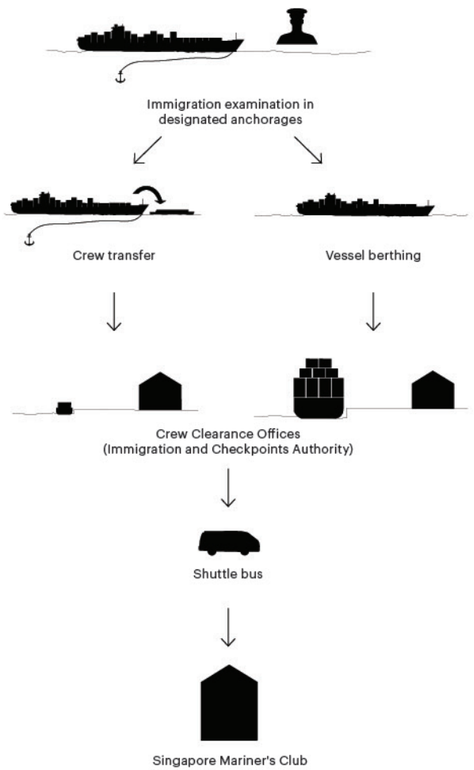
Marina South Pier is a terminal for tourists and day-trippers to the Southern Islands and a principal immigration entry point for seafarers. A series of shipping agencies, including manning and crewing agencies, work out of Marina South Pier and provide their supply services to the ships anchored at the anchorage zones nearby.

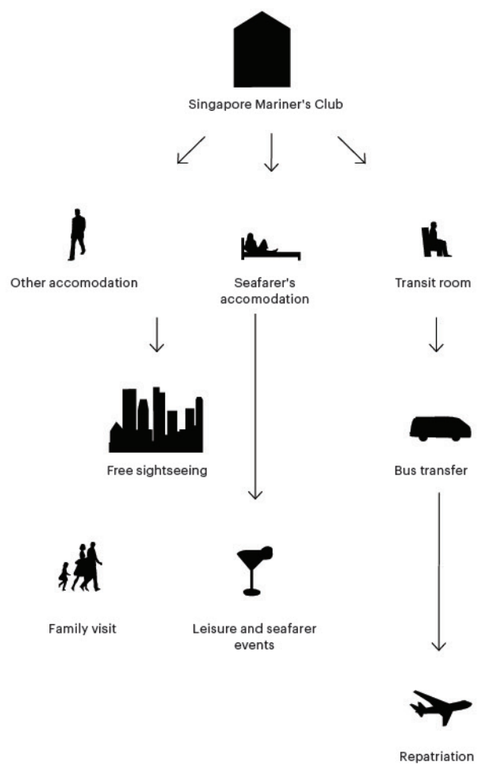
Marina South Pier and West Coast Pier are the only two landing points for seafarers that are not situated in a port. Therefore they are the sole gateways to land for seafarers willing to disembark from an anchorage zone. They also issue Landing Passes for seafarers who wish to go on land but are moored in ports without customs clearance.

The Pier functions as a waiting zone for seafarers who have either recently disembarked and are waiting to be transported to the city or seafarers waiting to embark. The Pier is connected to the city by means of two public bus lines, taxi or private transportation. It is situated near the Tanjong Pagar Terminal, but is somewhat dislocated from the city center. Although the Pier is an important immigration point for the city, stretches of undeveloped land separate it from the urban fabric.

Seafarer's Footprint

The above map shows the footprint of a seafarer in the city of Singapore in the form of the official map of Singapore issued by the MPA, Port Authority of Singapore and Singapore Mariner's Club. The map contains only part of the city, centered in Chinatown.





Disembarkation and Immersion in the City

Shore leave for seafarers is a very standardized process within Singapore, but in this post-9/11 environment, security controls and customs clearance have become even more scrutinous. The operation begins before they reach the designated anchoring zone.

Step 1

Once anchored, an immigration officer boards the vessel to control passports and the seamens' discharge books.
As a result, crew members receive either a landing pass or a sign-off pass (only for those who intend to leave the country once ashore).

Step 2

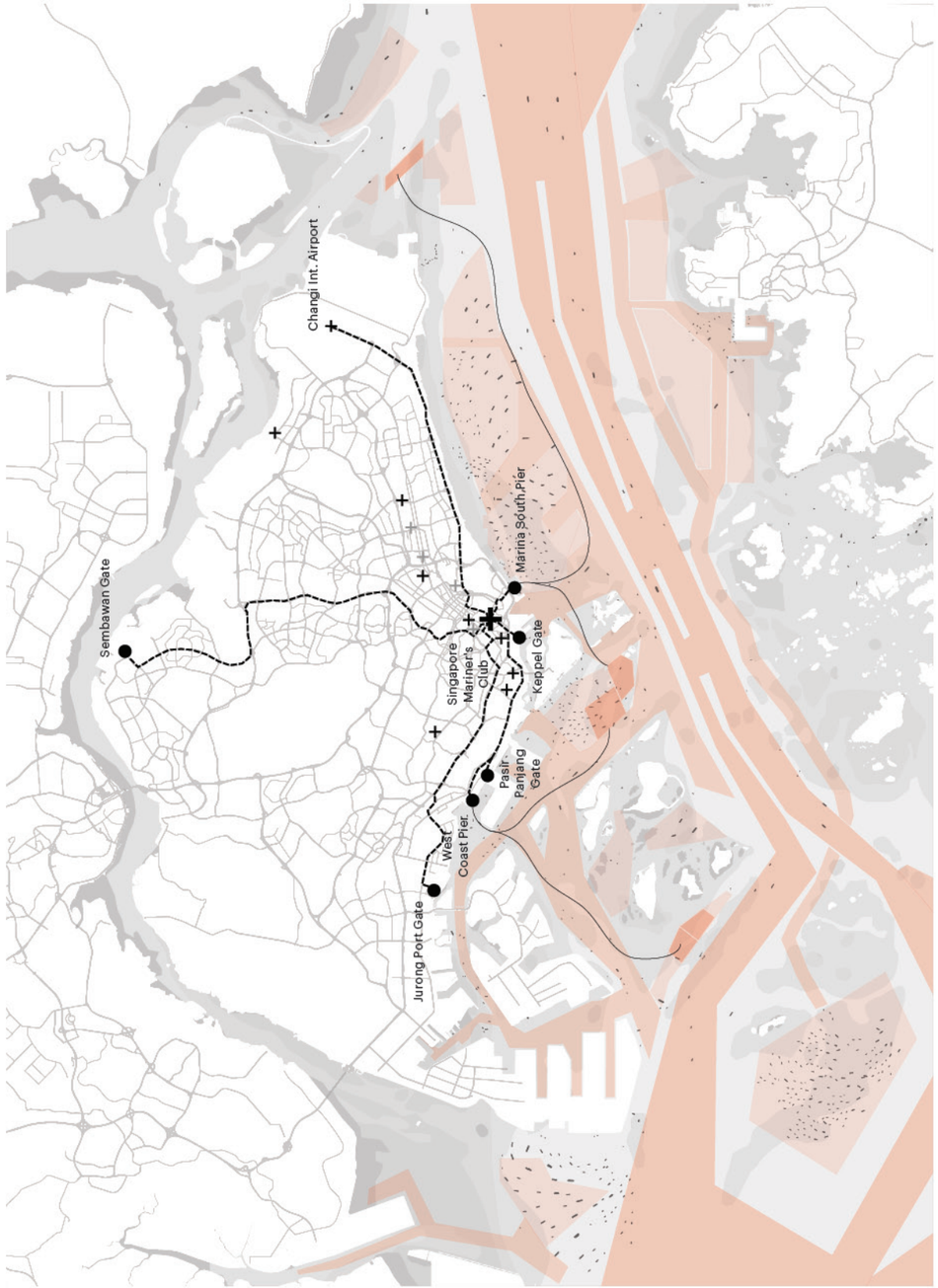
During the loading/unloading of the ship, only 3 officers are required to stay on board to supervise the operation. Therefore, most of the crew usually disembarks.
Seafarers who wish to go ashore necessitate a vessel to transfer them from the anchored ship. This has been or is organised by a marine agency in collaboration with the ship operator.
The passenger vessel brings the seafarers to shore to either Pier, where they are submitted to customs clearance and security checks.

Step 3

After having cleared the immigration process, they are transported to the Singapore Mariner's Club (SMC). The Marina Port Authority, the shipping company or the shipping agent organizes transportation of the seafarers from and to the SMC.

Singapore Mariner's Club

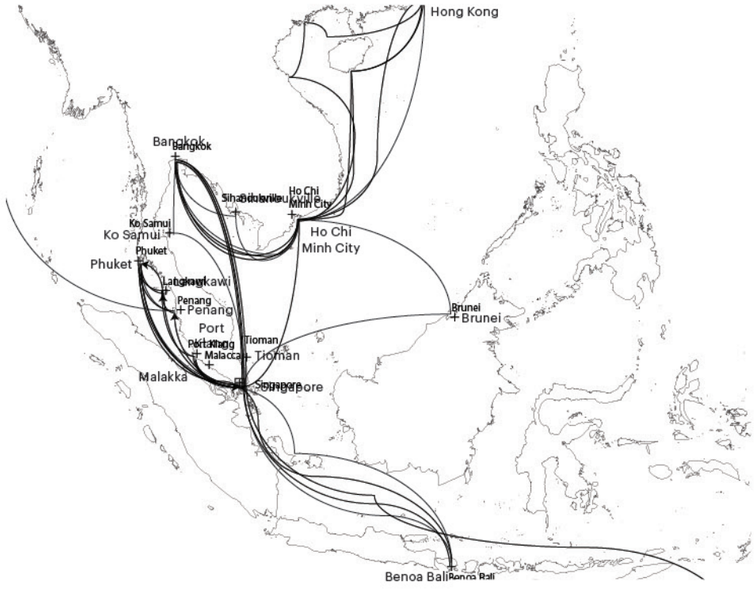
Once at the SMC, seafarers have the choice to either book a room, partake in the free recreational facilities provided by the Club (e.g. free sight seeing, monthly events) or relax in the transit room while waiting to be transferred to Changi International Airport for repatriation.



Tourists at Sea

Passenger cruising services were first introduced in 1844, but became widely popular in the 1960s after large passenger jets rendered ocean liners obsolete. Ocean-going ships became cruise liners, after the luxury 'one-class cruising' concept. No longer used as a practical means of transport, cruise liners were only for pleasure voyages, where the ship's amenities, destinations, and the voyage all became part of the pleasurable experience. Cruise operators have been constantly introducing new amenities on board and augmenting the volume of their ships, transforming them into city-sized floating hotels.

Cruise lines are unique in character for they are partly in the transportation business, and partly in the leisure entertainment business. Cruise ships carry anywhere from 500 to 6,000 passengers and an almost equal amount of crew.



Shipping: Cruise vs. Revenue

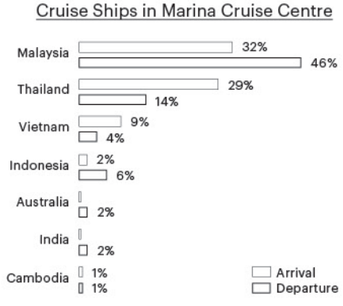
Passengers :	1 Million per year
Port calls :	350 per year
Revenue for Singapore :	1,5 Billion SGD per year
Revenue per ship :	4'285'700 SGD

A Fashionable Destination

Southeast Asia, in the last decades, has become a popular destination for tourists and even more so as a cruising destination. From Burma to the 18,000 islands of Indonesia, this region is rich in contrasting cultures. From major port cities like Singapore, Kuala Lumpur, and Bangkok, to tiny fishing villages and ancient temple complexes, the area is abundant in cultural and natural sights to visit. Yet the passenger of a cruise liner will only have the opportunity to have a small glimpse of all this, as every stop is limited to a mere couple of hours at any destination.

Singapore alone attracts a total of more than 30 international cruise ships per year, operated by 10 cruise lines, making about 400 port calls. The vast majority of these are arriving from or departing towards Malaysia.

Cruise Ships in Marina Cruise Centre




1.


2.


3.


4.

Peripheral Infrastructure

Singapore's two cruise terminals, Marina Bay Cruise Centre and Singapore Cruise Centre at Harbour Front, receive over one million passengers per year. Boasting ideal geographical location, the Marina Bay Cruise Centre is capable of accommodating 'the largest seafaring cruise liners in service today'. Deep waters and the absence of height restrictions provide a large turning basin even for the largest vessels - this means you get to experience faster docking and lesser waiting time, regardless of the cruise line you are on, promotes the Marina's site.

With two cruise ship berths and spacious terminal and car park areas, the facility resembles a modern day airport. Like many newer airports, it is situated on the periphery of the city. Hence, passengers most often rely on the coach services offered by the cruise liner in order to visit the city. The design of the building in itself is car-centred, as the main entrance and whole ground floor are a car park and coach bay area. To access the terminal one needs to take an elevator from the interior of the car park and ascend to the main lobby.

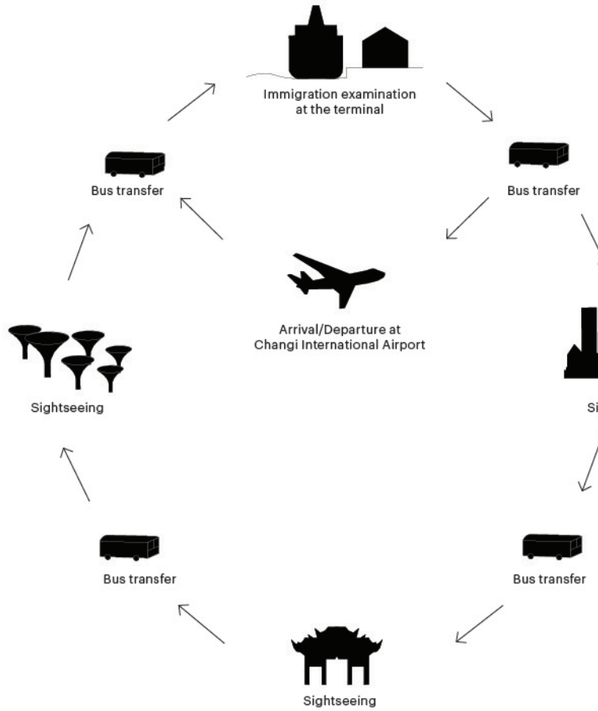
The immigration process is very streamlined and passenger turnaround (since disembarking the cruise ship till leaving the terminal) is about 30 minutes. The terminal is designed to handle two 3,000-person cruise ships concurrently berthed with a total throughput of 13,600 passengers.

1.
Marina Bay Cruise Centre seen from Marina South Pier

2.
Marina Bay Cruise Centre seen from the city

3.
The connection to the city: Marina Bay Cruise Centre's ground floor

4.
Waiting zone

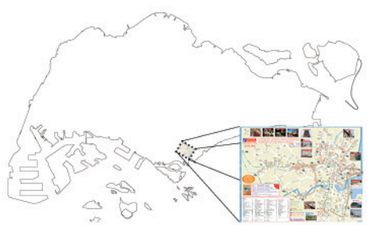


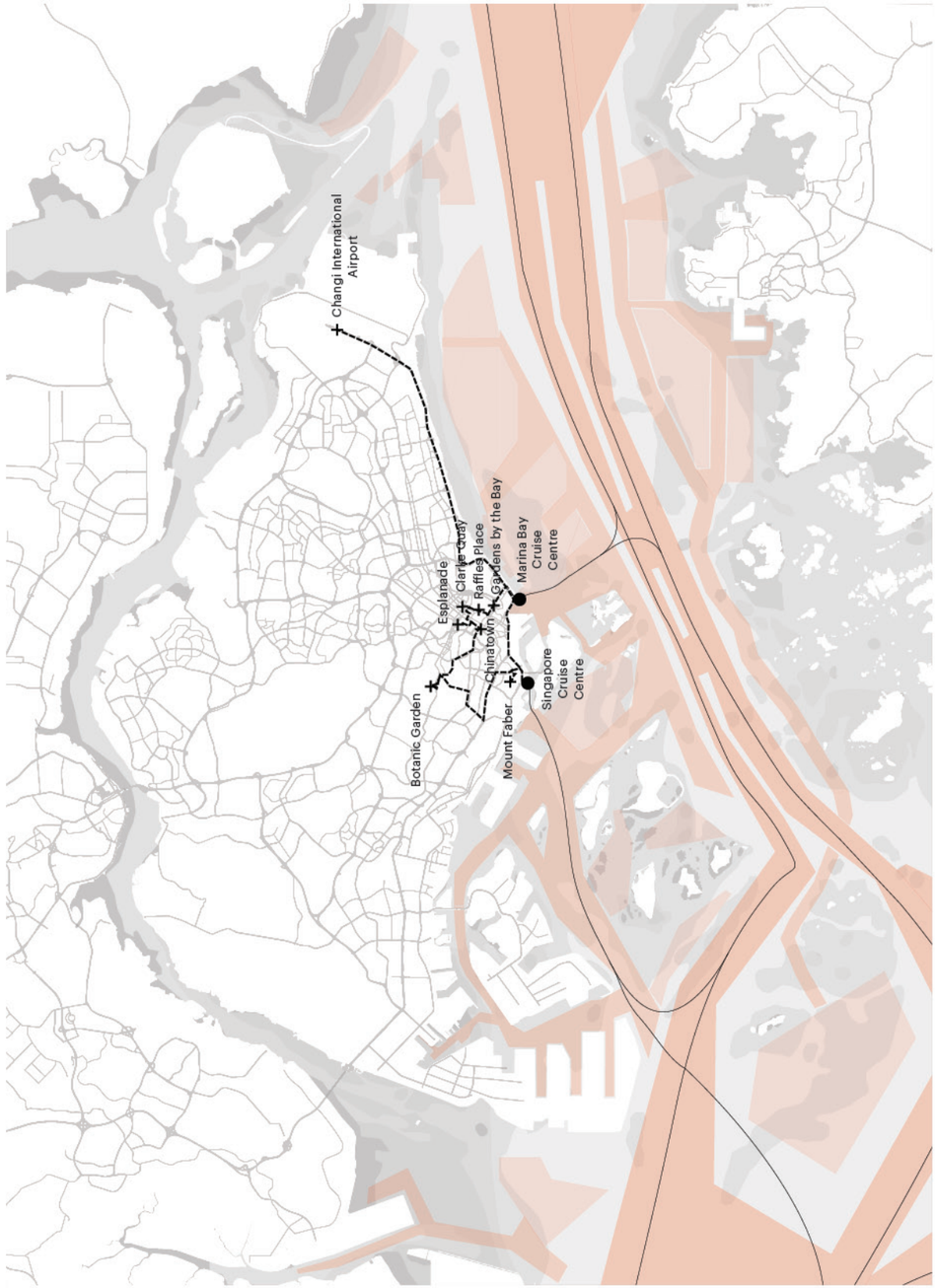
Touring by Coach

Median berth time of any cruise liner is of about 12 hours. Typically a vessel arrives around 8 am to Marina Bay terminal and departs around 6 pm. Passengers have the choice to disembark or stay on board while berthed. Those who decide to visit the city have the opportunity to participate in one of the tours proposed by the respective cruise line that provide organized tours of the city by coach. With a duration of about 5 hours, they are designed to swiftly take the passengers from one tourist attraction to the next, with breaks for eating and shopping. Regardless of the cruise line, these excursions visit the same destinations and do not wander off the trodden path of mass tourism.

The Tourist's Footprint

Cruise ship passengers have limited access to the city. In the case of Singapore, the map shows the main areas the passengers visit: east west from Raffles Place to Bugis, and north south from Orchard Road to Marina Bay.



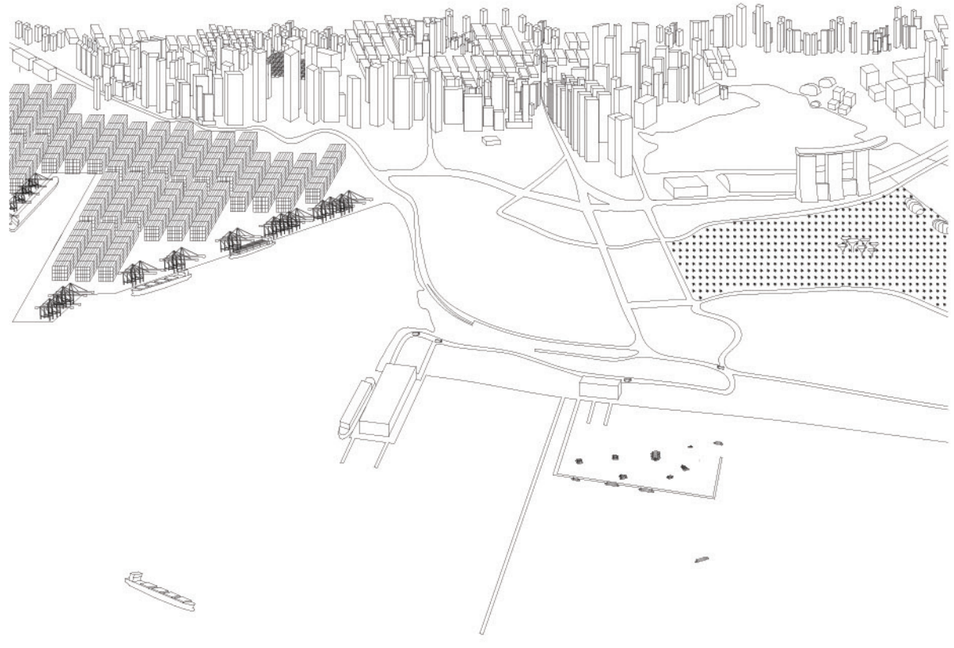


Near and Distant

In very close proximity, yet so far apart: Marina South Pier and Marina Cruise Centre are within walking distance from each other, but represent two very different worlds. One houses luxurious, ample waiting space, while the other has outdoor customs queuing spaces and plastic garden chairs.

Neither has an ideal connection to the city. They lie outside the city and far from any development, behind a multilane highway. Two public bus lines and a future metro line station provide the only access to the city.

The potential impact that these sea passengers can have on the city is drastically limited by these conditions.



Bird's-eye view of the Marina Bay with the two terminals and Tanjong Pagar terminal at the West

Merging Land and Sea

The sea has been an important part of some cultures since antiquity: from maritime civilizations, who recounted stories about the mythical worlds beyond the horizon, to mountain civilizations, which narrated tales of the sea at the end of the world. It has been travelled and explored since prehistory. This body of salty water that covers 70% of the Earth's surface has played an important role in human development. Our fascination with the sea is related to the act of returning home after a voyage; the 'nostimon imar', or sweet return of Ulysses in the Odyssey.
It is only in relation to the land that the sea acquires such an enchanting power. It is the connection of the two that renders either one strong and fascinating and creates this strong magnetism. It is the beauty of going to sea but returning to land that has captivated the imagination of people all through history.
Notwithstanding, the connection between land and sea in the Strait today is becoming ever more faint. Large stretches of industry and port-related infrastructure obstruct the connection between the two, scarce transport connections leave islands cut off and the local populations have still not grasped the full potential the sea has to offer them.

Map showing the stretching of the logistics territory over the Strait and it's coastline

A Disconnected Territory

The first and foremost notable obstacle in the connection between land and sea is the physical connection and accessibility to the sea. For an island nation, Singapore is profoundly disconnected from the sea, as the majority of its coastline is cut off to public access. This model has been extensively exported to the neighbouring seashores in the interest of infrastructural investments pertaining to sea trade, logistics, manufacturing, and oil refinery. The coastline has been acknowledged not as a generator of public qualities but, rather, as a generator of privatized and/or governmental interest. Only recently have development plans of the three nations shown a faint tendency towards the revalorization of the underestimated social relationship between land and sea.

1.

2.

3.

Detaching

Political, financial, strategic, social, or geographical: for many different reasons, Singapore's industry has concentrated along the coastline. This creates physical and social borders between land and the sea, and emphasizes the separation between Singapore and its bordering countries.

1.
Obstructed access to the sea at St. John's Island, Singapore

2.
Military zone in Singapore, Johor Strait

3.
Oil refinery facility in the Southern Islands, Singapore

Fewer Green Public Spaces

In a part of the world with a short modern history, but with great development in recent years that boasts substantial economic forecast of growth in the years to come, nature is a commodity still not completely marred or eradicated from the map. Development in Singapore alone has seen substantial amounts of rain forests and mangroves devoured by cement in the last decades, but grounds for hope remain firm in the likelihood that the adjoining countries will realize this necessity swiftly and translate it into territorial commitments within their strategic plans of the future.

Inaccessibility of the green coast in Johor Bahru

More Logistic Areas

Singapore has development plans to condense and relocate its industrial and logistics zones in favor of creating more coastline for public use. But the same cannot be claimed for the two neighbours. In a rush to catch up with the small giant, Indonesia and Malaysia are investing substantial amounts of money in order to expand and revamp their infrastructural and logistical capacities, with the ambition to reach or surpass the little red dot and partake in its economic boom. These plans project more and bigger ports, bigger logistical areas, shipyards and other satellite facilities relating to marine activities.

Shipyard in Batam

Underdeveloped Sea Transportation

In the city, land-based public transport utilizes urban space more efficiently, reduces transit time for a large portion of the general public, while propelling commercial and urban development. Its more efficient transit networks create greater accessibility to given areas, creating hubs that act as social condensers. Singapore's planning scheme, which combines public housing with public transport networks, is a sophisticated demonstration of an urban public transport network.

Extensive Road Access

Singapore, among the cities Johor Bahru and Batam, is an exception in promoting public land-based transport. The other two cities are very much car based. Yet also Singapore is extensively planned for private vehicle users, the road network represents a significant economic driver as a means of connecting different areas.

Negligeable Sea Access

Sea access within or between the three countries is greatly underdeveloped despite the potential bilateral economic benefits. Public sea transport is mainly limited to a couple of ferries connecting Singapore and Johor Bahru to Batam and Bintan in the Riau Archipelago. The efficiency, frequency, and punctuality of the existing marine public transport system could be improved.

As a result, many islands, like Singapore's Southern Islands, are poorly connected to their main islands and mainlands.

Living with the Sea

Throughout history, the sea has been an important part of civilization. Today, the sea continues to play an important role in daily life, offering not just economic and commercial mobility for societies, but an emotional and mental connection for individuals. Studies describe the benefit of water in urban contexts; residents who visit the seaside for recreation testify to the positive effects of the sea. In the Singapore Strait, restrictive public access to and limited visibility of the coastline contradict these known benefits.

1.

2.

The coastline:

1.
Industrial, logistical and military use

2.
Public use

3.
Natural green areas

3.

The Non-Accessible Coastline

Description: functions with sealed-off, highly secured areas that require special clearance and/or permission to access them; the sea is obscured behind high walls, gated compounds, and thick layers of bushes.

Types: Industrial parks, logistics zones, cargo storage, port terminals, shipyards, oil refineries, military zones.

Location: most of the coastlines of Singapore and Batam.

The Accessible Coastline

Description: recreational coastal areas, accessible to the public; coastal areas which are not gated or restricted to public access becoming rarer as the economies build around the Strait grow.

Types: seaside promenades, parks, redeveloped wharfs.

Location: Malaysia has the most open coastline. Through its 2006-2025 Comprehensive Development Plan, it is the only country at present proposing a coastal protection plan coupled with balanced development.

The Partly Accessible Coastline

The Malaysian Development Plan described above includes an agenda to protect 231 square kilometers of mangrove along the coastal zone. This vegetation, which protects the shoreline from erosion, has been drastically degraded and encroached upon by development in Singapore and Indonesia. The changing coastline is visible in the map of the natural green coastline of the Strait.

1.

2.

3.

4.

5.

6.

1.
Intersection of Pasir Panjang Road with Clementi Road

2.
Construction of the new part of Pasir Panjang terminal

3.
Harbour Drive

4.
Void and gated space between industrial buildings

5.
Pasir Panjang entrance for employees

6.
Labrador Park

The Unfriendly Coastline

Description: Few pedestrian access points to the sea and physical and visual obstructions are not the only problems of the coastline in the case of Singapore.

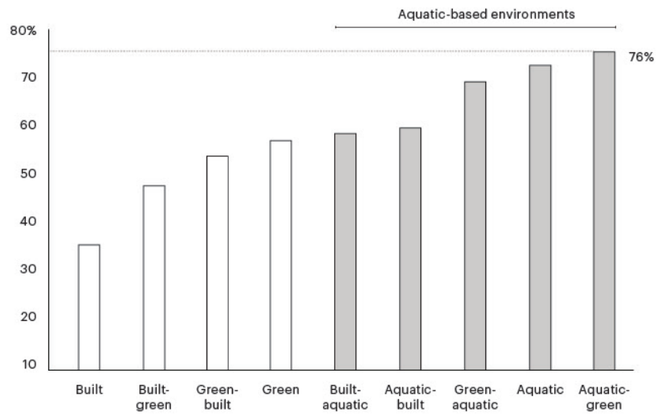
Types: Areas of hostile infrastructure, buildings not built at pedestrian-friendly scales, industrial-type barriers and facilities, highways that are difficult to traverse, lack of public facilities, and an overall impression inconsistent with that of an urban coastline.

Location: Singapore

Urban Blue: The Value of Water

Although water covers more than two-thirds of our planet, the sociological benefits of living with 'Blue Spaces,' or aquatic environments, has yet to be fully explored. Recent studies conducted in the fields of environmental psychology, geographical studies, evolutionary psychology and landscape planning describe the value of aquatic environments in 'promoting social, economic, and environmental objectives and influencing human well-being.' Urban planning that introduces more trails along bodies of water and wetlands produce more livable, sustainable cities that promote the mental well being of their citizens.

A 2010 study from the School of Psychology, of the University of Plymouth, UK (see graph right) demonstrated the clear preference individuals show towards built environments that contain aquatic elements, even over 'green environments'.



Maersk Container Ship

Capacity: 20 persons
Surface: 70'000 m²
Surface per person: 3'540 m²

Cost: 185 Million SGD
Dimensions: 400 m x 73 m x 59 m

Cruise Ship Oasis of the Sea

Capacity: 7'700 persons
Surface: 17'000 m²
Surface per person: 22 m²

Cost: 1'300 Million SGD
Dimensions: 360 m x 72 m x 42 m

Belakang Padang Island

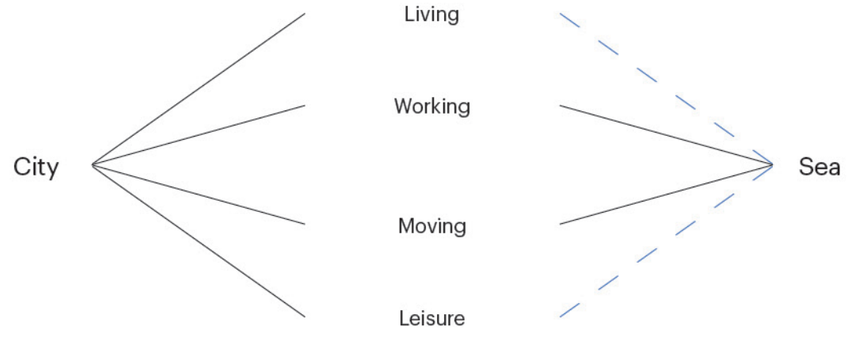
Capacity: 18,000 persons
Surface: 350'000 m²
Surface per person: 19.4 m²

Cost: -
Dimensions: 1.7k m x 1.9 km

The Pinnacle

Capacity: 6'000 persons
Surface: 254'000 m²
Surface per person: 42.5 m²

Cost: 279 Million SGD
Dimensions: 45 m x 163 m x 24 m (x7)



Towards a Balanced Use

In recent history, the sea around the SIJORI region has primarily become used for industrial and commercial purposes. However, it holds the potential of hosting a broader urban program and being better connected with the whole trinational territory.

Potential for the Public Sea

Through a process of superimposing and subtracting the different layers of use of the region, like density, logistics, private land use, we searched for an ideal place to reclaim the coastline from its industrialized, privatized state. By counterbalancing the intense industrialization and segmentation that has taken place on the coastline, the sea itself, and the few unused islands, could recreate a connection between land and sea.

Density of Free Space

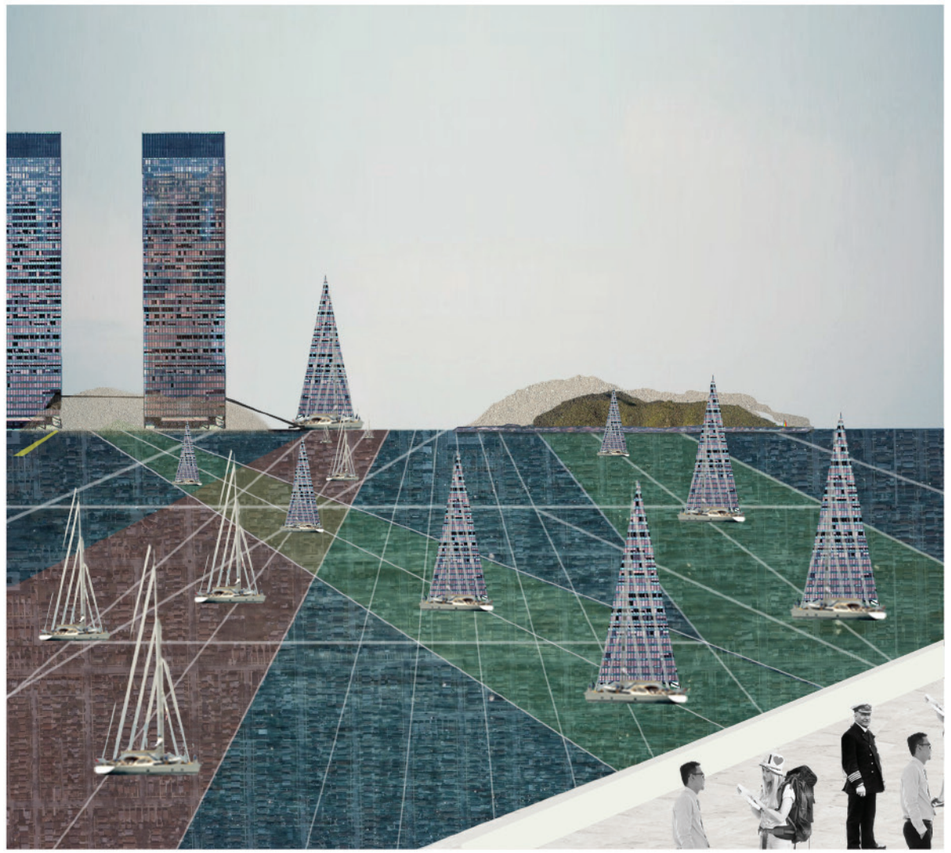
Relatively unused space

N

0 2.5 5 km

Oceanopolis

In classical antiquity, Oceanus is the divine personification of the sea, an enormous river encircling the world.
Oceanus was the ocean-stream along the Equator, in which the habitable hemisphere floated.
Oceanopolis is the intention to create a floating habitable hemisphere on the ocean stream at the Equator.
Oceanopolis is about Sea Urbanism in the Singapore Strait.
Oceanopolis is about breaking barriers.
Oceanopolis is about bridging the gap.
Oceanopolis is about drawing a new line.



The intention to inhabit
the Strait

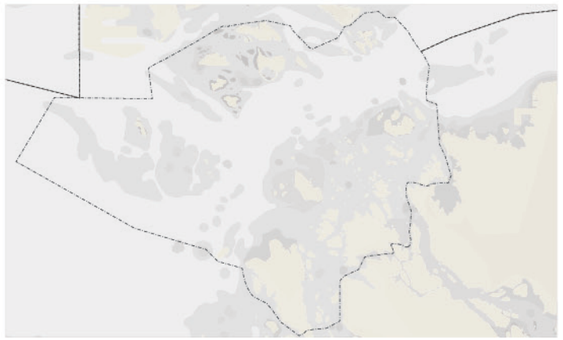
Oceanopolis

- Culture
- Heritage
- Leisure and tourism
- Protected nature
- Research and development
- Free trade market
- Education
- Industry
- Hub
- Amenities ship
- Speed boat
- Seafarer' gateway
- Passenger gateway

0 2.5 5 km

N

1.



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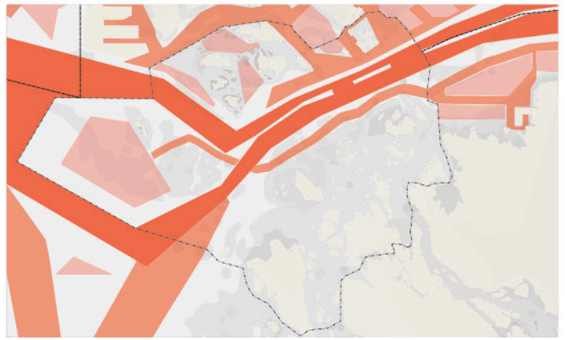


3.

Breaking Barriers

A New Territory

Oceanopolis will present an opportunity to reevaluate the restrictive borders in the SIJORI region. They have become obstacles between people and ideas that prevent communication and hinder shared progress.

Oceanopolis will address this issue by proposing a Trinational Trans Border Special Zone (TTSZ) as a public platform for the free circulation of people and ideas within the Strait.

Borders

The project does not foresee the alteration or cancellation of any national and international boudaries and regimes, but would instead create an interstitial zone with special regulations for visitors and residents from the three neighboring countries.

To define the site and territorial extents of the TTSZ, we used existing geomorphological elements and previously established borders. The territory incorporates nearby islands of Singapore's Southern Islands and the Riau Archipelago, which are not in current use. Geographic centrality to all three nations was critical to establishing sociopolitical neutrality.

Density of Free Space

We initially set out to choose eligible islands for hosting functions and facilities. Proximity between them was considered. Islands with heavy industrialization, high degrees of land use or dense populations were excluded. Larger islands like Batam were excluded because of potential immigration or infrastructural issues.

Borders and Geography

Another rule to establishing the zone's boundaries was to maintain a maximum distance of 15 km from the 'mainland' coastlines of Singapore and Batam. The 15 km rule was further applied to circumscribe the islands that were chosen to be included in the zone defining, thus, another portion of the border.

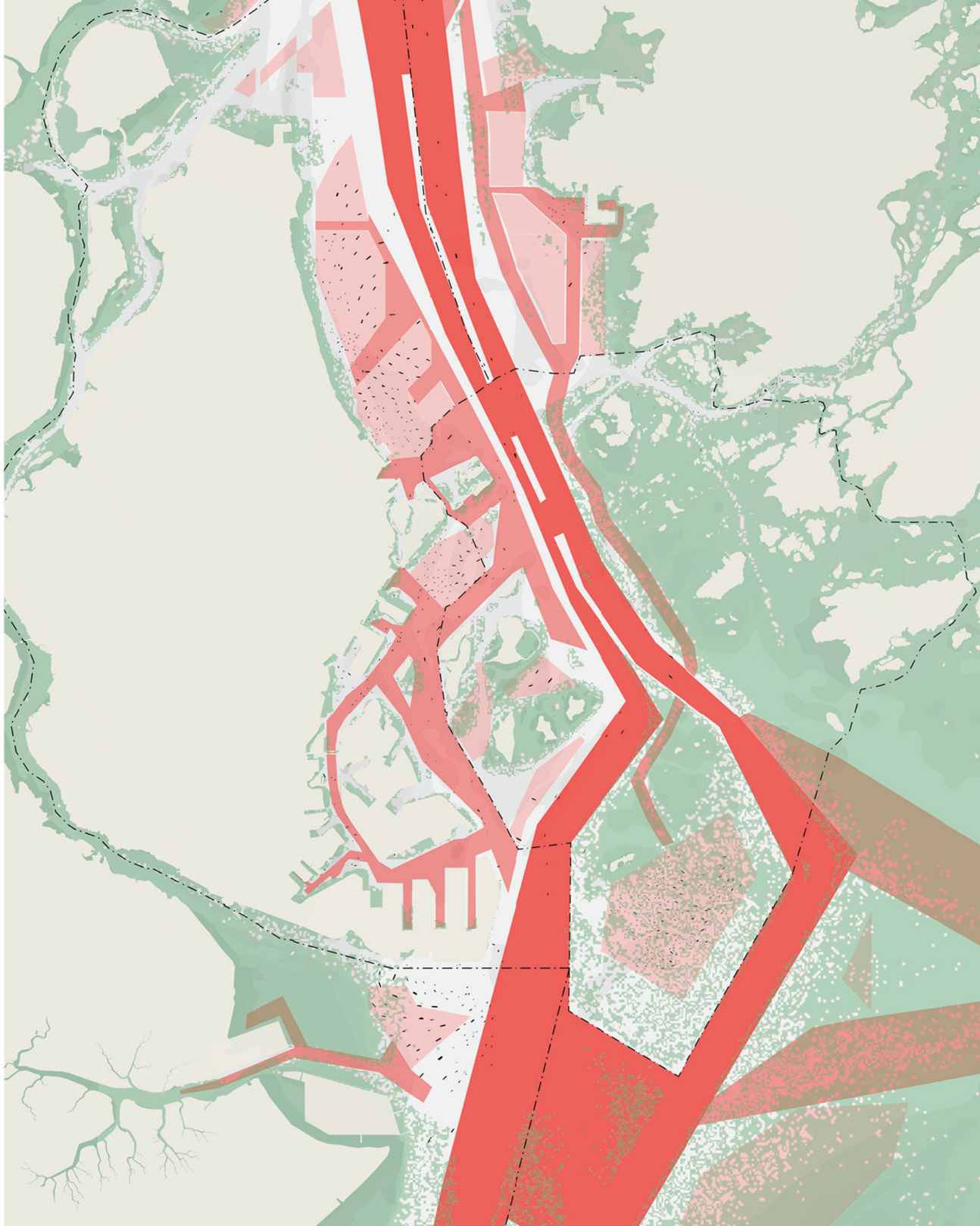
Fairways and Anchorage Zones

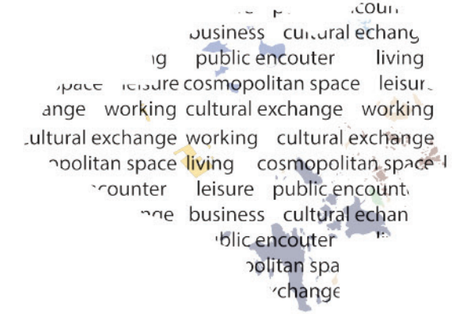
The zone borders are designed to minimize crossings or interactions with the Strait's industrial fairways and traffic ways. While it was not possible to exclude the logistical areas entirely, by taking advantage of turning zones and international waters, the border could be set with minimal impact to the existing corridors.

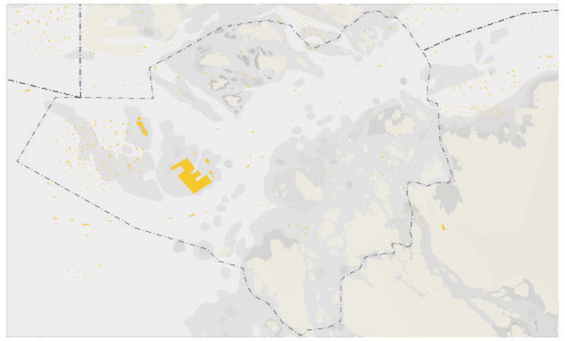
1.
Density of free space

2.
Borders and geography

3.
Fairways and anchorage zones







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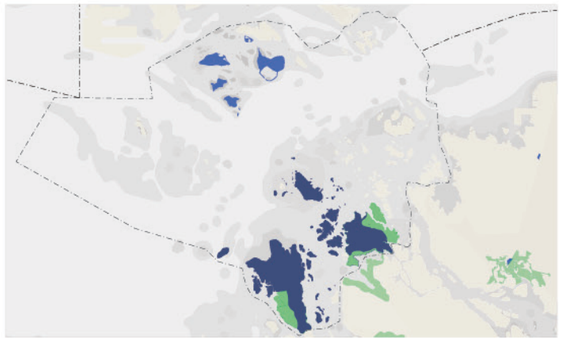

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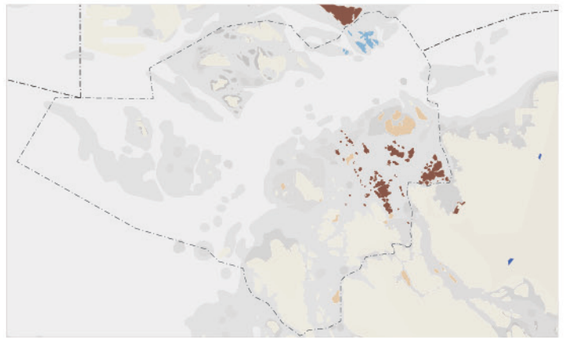


3.

Bridging the Gap

A New Public Space

Oceanopolis is an attempt to re-introduce a public space in an otherwise logistical territory. The concept is simple: if the land in the Strait territory divides, then the sea will unify. Shared regional population growth, in the interest of all three countries, is central to the conception of the Oceanopolis, a united, sea metropolis.

Identities

Oceanopolis is subdivided into five clusters of islands, each one with its own functional identity and hub. Each cluster has an individual identity for a better programmatic distribution and division of the planned facilities, but also as a means to avoid polarization of use on certain islands only.

The clusters operate on hub and spoke logic, with principal infrastructure and infrastructure concentrated on the main island, and satellite functions distributed among the lesser islands.

Seafarers and Industry

The most radical proposal of Oceanopolis is the construction of a floating island within international waters. It will house an open market and bunkering zone located right next to the Nipah NTAA and within the special international trade zone. Suppliers from all three countries could sell their products here, allowing them better access to a wider market. Ship operators will also profit from the more competitive prices offered.

By offering dedicated dwellings and other facilities catering to seafarers, the floating island will offer a meeting place specifically for them.

Education, Research and Development and Nature

In a trans border, international and multicultural environment, education an research have the capacity connecting like-minded people of different backgrounds in seeking common goals. Youth centres, universities, art schools, open offices, think tanks, start-up parks are open platforms for thinking, creating, discussing, research and learning across national boundaries.

Culture, Heritage and Tourism

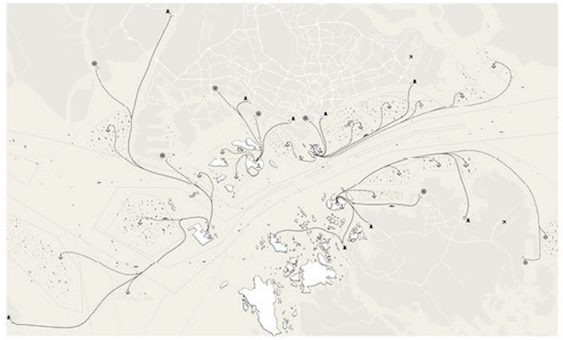
With more than 2,000 years of history, the Riau Archipelago is rich in historical heritage. From floating kelongs to wooden pancungs to the local cuisine, heritage is not only legible in the built environment, but in the everyday lives of its people.

Although the Riau has long been attractive to tourists from across the globe, Oceanopolis would promote a form of tourism that sustains local traditions and practices. Locally recognized landmarks such as the renowned seafood of Belakang Padang would gain protective status.

1.
Seafarers and industry

2.
Education, R&D and nature

3.
Culture, heritage and tourism



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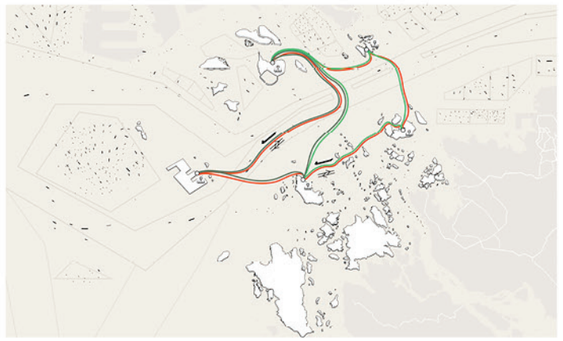

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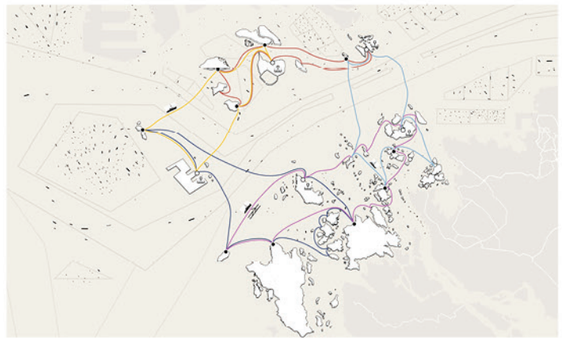


3.

Drawing a new Line

A New Network

A well-designed program without the means to access will become obsolete and ineffective. Oceanopolis proposes a new transit network within the TTSZ that works as both catalyst and attractor. This new public transport system is designed to improve efficiency, accessibility and lower overall travel costs for passengers from the three surrounding countries. It will be complementary to existing transportation networks. Marine access to the zone will be regulated and priced like the Singaporean electronic road pricing system. Government subsidies would keep the system functioning and prices competitive.

External Connections

Hub-based external connections would link passengers to and from airports, cruise terminals and ferry terminals via quick and easy intermodal changes. The zone would not require any immigration access. Passengers could directly transfer from one transport system to another at this central location within the Strait.

Seafarers are also connected to the TTSZ by means of small-scale connections that arrive to their respective anchorage zone or port terminal.

Free or reduced fares would make transportation within the zone more attractive to passengers and seafarers.

The network is divided into two systems of transport, both involving water transport:

Ring and Circle Lines

Similar to a land-based metro system, the transport network has three major lines. Larger, slower ships, at a medium frequency, service these lines. They will host other functions on board, such as markets, food courts, temporary exhibitions, or flea markets, to enhance the passenger's travel experience.
- The circle (red line) connects the hubs along a circular route.
- Two ring lines (dark and light green lines) connect three and four hubs respectively, crossing diagonally through the fairway.

Local Connections

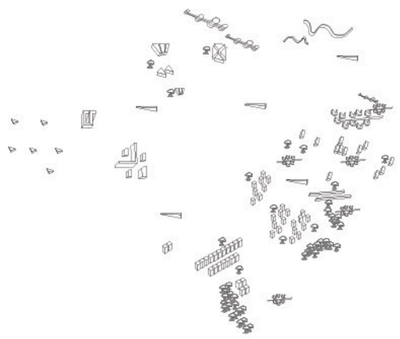
Similar to a land-based bus system, smaller, faster ships would connect the outer islands to the hubs at a higher frequency. Every hub in the system is connected to two different lines, thus each line connects two hubs and two clusters. This creates many secondary hubs that give passengers multiple transport choices.

The docking stations for both systems would accommodate swift berthing and unloading and loading of passengers to reduce queue times.

1.
External connections

2.
Ring and circle lines

3.
Internal connections



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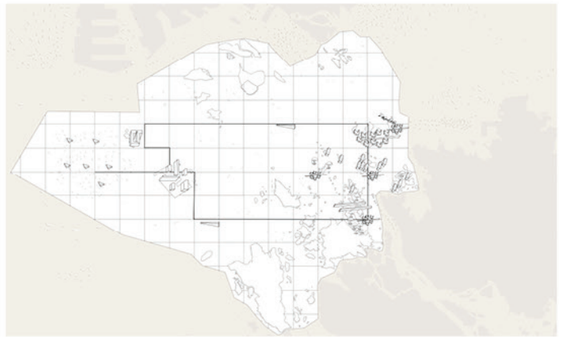

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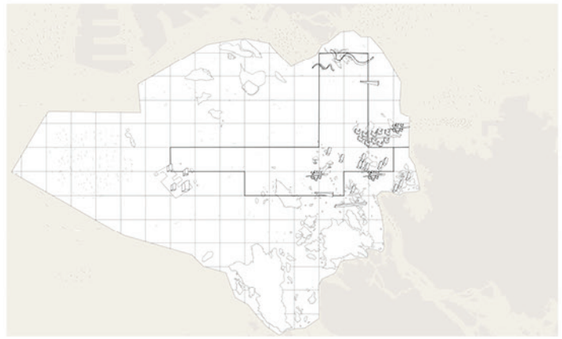

3.

Urbanizing the Sea

A New Population

Oceanopolis will introduce a new spectrum of programs to attract heterogeneous user groups - tourists, seafarers, local residents, foreign students, researchers, artists, and businessmen - to the Strait. As different clusters accommodate specific programs, they will attract a changing mix of user groups throughout the day, month, and seasons.

A Local's Day

A local university student arrives from Singapore by boat in the morning. He takes his courses and uses the fast boat connection to cross to the next island, where, in less than ten minutes, he borrows books from the library. In the afternoon, he heads to the park, where he has a small picnic with his friends. He uses the Ring line to cross to the other islands and takes advantage of the journey to buy some groceries from his favourite vendor on board, who by now knows him by name.

In the evening, he meets his girlfriend for a short walk along the coast. Afterwards, they make their way to the theatre to watch a performance based on stories and myths of the sea, which is organized by the Riau Arts Association.

A Seafarer's Day

A deep-sea mariner from a cargo cruiser that just set anchor near Tanjong Pagar terminal has been transported with a passenger vessel to the Seafarer's hub. There, he initially books a room for the night at the dwellings specially designed for the short-term needs of seafarers. The concierge gives him a day pass to use any means of transport within the TTSZ, which is free-of-charge during his stay. He heads out straight away, takes the circle line and in 35 minutes is at Belakang Padang, enjoying his preferred Chili Crab.

Afterwards, he joins a friend at the bar for a quick drink and then returns to his room for a well-deserved rest. In the morning, he rejoins his ship for Korea.

A Tourist's Day

After flying into Changi Airport, the couple boarded a vessel at Tanah Merah that brought them directly to Funtasy Island. There they had a nice breakfast on the seaside and got to know a local woman who makes handmade bracelets. They later take the boat to the Seafarer's hub. There, they meet the woman's brother, who is a captain. His ship is berthed in Pasir Panjang, loading new cargo for his upcoming trip to India. After they meet, they head to Pulau Sambu, where they have booked a tour of the museum with a archaeologist friend. At the end of the day, they enjoy lobster at their reserved table at the hotel's restaurant.

1.
Local Resident

2.
Seafarer

3.
Tourist

'Our vision is... an island with an increased sense of 'island-ness' [...] as well as better access to an attractive coastline and a city that embraces the waterline more closely as a signal of its island heritage', URA, Living the Next Lap: Towards a Tropical City of Excellence, 1991.

Twenty years after this declaration of the Urban Redevelopment Authority of Singapore, the city is still fighting to acquire its identity. Finding itself in the middle of an economic boom, this region, Singapore and its siblings, has not had the time to critically assess its goals and directions. Inclined to follow the road that guarantees success and thus a place on the world map, the fragile situation of this region leaves small margin for questioning. Uncertainty is not an option. And the sea, the coast, the relation to the neighbouring countries are all illustrations of uncertainty. It will take time to comprehend them and embrace them. But then, this region will have the opportunity to reestablish its relation to the sea and use it for what it is: part of its habitable territory.

The Strait as a public space

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