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THE FLUID LATTICE

by

JILL NAI-CHIEN CHENG

A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE

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APPROVED, THESIS COMMITTEE:

Carlos Jimenez, Chairman
Associate Professor
School of Architecture

David Brown
Assistant Professor
School of Architecture

William Williams
Visiting Assistant Professor
School of Architecture

Houston, Texas
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ABSTRACT

The FLUID LATTICE

by

Jill Nai-Chien Cheng

Without well-defined public spaces, coherent city planning, the cities in the East appear more chaotic. However, in the middle of this dense fabric, people have transformed the void spaces, such as streets and sidewalks, into exciting and intriguing public spaces.

Examining its two oldest markets, Night Market and Fish Market, this thesis is an attempt to develop a new model of street activity densification on a larger scale in Keelung's most prominent but discarded waterfront in northern Taiwan. Since the site situates at the mouth of both bus/train station and Taiwan's only highway, this area has the potential to be transformed into another significant public space for the city, residents, and visitors. Brining people into direct contact with the water, various shops, and the transportation hub are the main goals. Lightweight structures, booths, stalls, walkways, and ramps will be set up along the edge and floating on the water to create an interactive LATTICE with interconnected layers that provide a more user-friendly environment.
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INTRODUCTION

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Urban design in the West and East is contradictory. The western attitudes are refined and restrained design principles whereas the eastern cities possess chaotic or schizophrenic qualities. The orders, such as well-defined public spaces, coherent groupings of buildings, etc., are not present and seem irrelevant. Before closely examining the city of this thesis' study, Keelung, Taiwan, a larger and already modernized Asia city, Tokyo, Japan can be used as a prototype. The intimate relationship between Taiwan and Japan is like Hong Kong and Britain. Japan has occupied Taiwan for fifty years in the first part of 20th Century. After Chinese government regains control, Taiwan has developed and maintained most of the infrastructures left behind by the Japanese. Thus, any major cities in Taiwan consist of similar urban fabrics and layouts as the ones in Japan.

The western scholars have been carefully studied Tokyo and others for the past decades to discover its hidden order and compare the differences. There are three main hints according to Barrie Shelton: 1. Behind Japan's urban forms are ways of thinking and seeing which are quite different from those of the West; and these are rooted deeply in the wider culture. 2. These deep roots, being cultural, are mostly also old roots, although modern appearances may often belie this. 3. Many characteristics of Japanese cities, though rooted in national culture and history, have
much affinity with contemporary ideas in science and philosophy which are mostly western-generated-ironically, more affinity than the characteristics of Western cities themselves.

Starting from the basic languages, English and Japanese are distinctively different. As Shelton points out, English writing focuses upon lines while Japanese upon area. Furthermore, Western letters are totally abstract units that carry no meaning. By contrast, Japanese characters can stand-alone and are stylized pictorial representations of objects or ideas.

This difference between line and area also reflects on the buildings and the cities. Western buildings are more about the "wall"; Japanese architecture is about the "floor". The lines of the wall that are dependent to one another complete the task of spatial demarcation. With the emphasis on the floor, the space retains flexibility of use and growth. In urban layout, west emphasizes the linearity of street systems that becomes aesthetic ordering of cities. Cities, in Japan, are identified by street blocks. The leftover spaces become the streets, which are usually not linear. Thus, the city fabric appears more chaotic then western cities.

Japan has put greater emphasis in city place making on content while Westerners have been more preoccupied by form. The intensity of activities and the color of events and signage along the street are integral part of the city life.
Film and literary critic Donald Richie reflects in his essay, "Walking in Tokyo":

In Europe, one is part of the display – to see and be seen, to look and be looked at. The street is a stage. How different Japan… You, the walker, are not the actor. Rather, you are an active spectator. The display is not you and the others about you. The display is the street itself. The direction is not from you to it but from it to you. Shops line the street, open up, spill out. Clothes on racks and sides of beef alike are shoved onto sidewalks. The fish shop's scaly glitter is right there, still gasping. Baby televisions piled high blink at you eye to eye… on the Tokyo street, there is the raw profusion of consumptions itself.

which indicates the strength of the setting and the form of the space, is more important. Without the content, the street/plaza is still powerful. However, in Japan, the street becomes lonely and deserted. Thus, the commercial activities on the street are everywhere. The only similar examples in West are probably the weekend flea markets and the strip of Montrose antique shops in Houston.

Ancient and modern built-forms coexist in the chaotic eastern urban design largely due to the religion. Shinto shrines, the native religion in Japan, scatters everywhere in the landscape. Its function can be very independent, and its form, scale, arrangement and setting unpredictable and localized. Thus, when rebuilding, with respect to the tradition, one builds and constructs the new around the old. Another religion, Buddhism, also
plays a major role in the city landscape: the idea of temporaries. The reincarnation of the human life and built-form is closely related. Human beings never die; they just transform into another from or object for next generation. The built-forms contain similar spirit. Due to the constant natural disasters, such as earthquakes, volcanic activities, and typhoons, destruction of buildings are common. In addition, the speed of technological changes reinforces the short-life building tradition. In Buddhism terms, buildings still retain the same spirit after rebuilding. Therefore, building still lives on metaphorically. In the Western Christianity, the church or cathedral is the focal point in the old city, in terms of height and importance. Thus, it not only is forbidden to be torn down, and should be protected and renovated. Therefore, comparing to Japan, the Western City seems to be more stable with less constant construction and rebuilding, which projects an image of chaos for the outsiders.
Keelung

Using this analysis on Japanese cities as the background, one can discover that Keelung, Taiwan, has the similar qualities. Compare to Tokyo, Keelung is only a small city with 385,000 population. The name originally means “chicken cage” in Chinese because of the usable land is caged in by mountain ranges at east, west, and south, and by the Pacific Ocean at north. Now, by changing the characters, it means “rich and fertile base.” The entire city is divided into seven regions with specific names. However, this thesis focus only on the area surrounding the harbor.

Keelung, a 40-minute drive northeast of Taipei, is one of Taiwan’s international seaports and transportation hubs. Throughout the history, Keelung has been invaded by Japanese, Dutch, French and Spanish because its strategic location provides economic importance for the island. Now, only a few traces of the turbulent past have remained. Rebuilding Keelung is an ongoing process since post World War II. Keelung Harbor plays a significant role in the city development. Its natural physical qualities help the formation of
Keelung. Ever since the harbor was built in late 19th Century by Japanese, its importance has steadily increased. It eventually became the seventh largest harbor in the world in 1984. However, this single source of city income was deeply effected by the economic depression in late 80's and early 90's. The harbor business has never regained the past status because newer and larger harbors are built around the island to accommodate the advance technologies. Thus, Keelung Harbor faces an identity transformation. The democrat party government that came to power first time two years ago, has decided to change once only shipping-oriented business to a multifunctional, public accessible harbor, which provides tourism and other leisure activities to attract more visitors and increase the city revenue. Thus, improving and renovating the existing harbor facilities to accommodate this new program become a priority in the new City plan.

Buddhism also plays an important role in the development of Keelung but not in exact same influences as in Japan. Temples are part of the urban fabric in any cities in Taiwan. The three most important ones in Keelung are located in the downtown area. They initiate the street life that one experiences today. Temples always have been gathering places for people for religious
festivals. The official name for the Night Market is Miou-Ko (temple mouth) because it started in front of Dien-Ji Kong. It began with only few stands, and expands to two streets today. The focal point of the Wholesale Fish Market is Ching-An Temple, which celebrates the Goddess of the Sea, Matsu, who protects the fishermen. One can see the close relationship within the Market, the Temple, and the Harbor. The last temple is Cheng-Huang Temple, which faces directly at Keelung Harbor. The God in this temple scares away the ghosts coming from the ocean and protects all the ships. Thus, Harbor and it are inseparable functionally and visually connected. All three temples have been in Keelung over 100 years and they are the historical landmarks for the City. Also, Keelung hosts the biggest Ghost Month Festival in Taiwan. It’s the seventh lunar month, similar to Halloween, and during this month, all Chinese ghosts came out of the netherworld to be feasted, entertained, prayed to, and paid off, and to take revenge on the ungrateful, the disrespectful, and the unwary. On the fourteenth of the month, the entire downtown area is blocked off to have a parade of floats and bands accompanied by explosions of firecrackers. ■

Besides the Harbor and the religion, the other
significant part of Keelung is the street life. Like most of the Japanese cities, no one designated or defined plaza and square can be found in the City. All the activities and city lives happen on the street, whether it’s the traffic congestion, festival celebrations, etc. The effect of stores “spilling out” onto the sidewalk is even more evident here than Japan due to lack of zoning regulation. There are hundreds of stores lining up on every street and taking over the entire sidewalk system in the city. The two more specific and different examples are the Night Market and Fish Market. After the traffic is closed off at night, the Night Market becomes fully awaken. The great influx of people in this period of time can only be experienced personally. The liveliness in unimaginable. Before dawn, the Fish Market opens for business with the same amount of people rushing in to grab the freshest seafood of the day. All these activities are the contents of the street and what makes this city alive because one can always feel the energy of the people.

However, regardless of its location and size, every city faces the pressure to modernize. Keelung, a three hundred-year-old city has the
same problem, too. Currently, without a clear overall urban design, the city has grown haphazardly for the past few years and the quality of living is declining. Using new technologies to build taller and taller building isn't the solution to help the city redefine its "modernity". In order to for Keelung to reidentify and restructure itself, recognizing its unique characteristics and strengthen them should be the first step. The following issues are the inspirations for this thesis:

1. Keelung is a "24 Hours" city. Ever since its establishment, the city has different functions at different times of the day. Starting at 2 am, wholesale fish market opens since this period of time is when the fishing boats come back. At 8 am, a large portion of the city population starts leaving town to go to Taipei to work. Therefore, the city seems empty during the day. At 5 pm, all the residents start rushing back to town and the city enlivens again. After sunset, night market start getting busy and stay open past midnight. This cycle goes on everyday, except on holidays.
2. Keelung is an “in-between” city. It becomes a transportation hub because it used to be the city one has to pass through to go to the east coast. Even though there are more options now to reach the east coast, people who are driving still prefer this route due to its pleasant ocean views and smooth ride. (Others are dangerous, especially in a stormy weather, mountain roads.) Also, the public transportation, bus and train, stops at Keelung before reaching the destination. The majority of the island population lives in Taipei, the capital that locates at south-west side of Keelung. These people would travel to the north and east coastline (passing through Keelung) for the weekend leisure activities. People that live in the east side of Keelung, always need to travel to Taipei to government-related works.

3. Keelung is the north endpoint of the longitudinal axis of Taiwan. This
unique location is why it has been a battlefield throughout its history. By
conquering the city, one would take control the “mouth” of Taiwan. Spanish,
Dutch, French, and Japanese all left their traces here. Therefore, when
Taiwan starts to modernize thirty years ago, Keelung becomes the entrance of
Highway 1, the only north-south freeway in Taiwan.
Site

This site is part of Keelung's Central Business District (CBD). It consists part of the harbor edge and extends to the bus/train station area. It's about 850' long. This is a dangerous area for pedestrians due to the heavy traffic on Chung-I Road. People have to use the two skywalks to across the street. A 10' wide sidewalk runs along the harbor edge. Chung-I Road, a major thoroughfare in the CBD because it not only links the bus/train station to the other parts of the city, but also leads to the ramp for the highway.

Keelung Bus/Train Station locates in a cul-de-sac like area. The traffic becomes one way. Even though the city has allotted a wider space at the entrance of the station for taxi parking and drop-off area. However, there are just too much traffic to keep the area functional. These two and three buildings are about thirty to forty-year-old. The design is simple: concrete roof structure over the passenger area. Some retail spaces are inserted five years ago to promote more business.
As Keelung flourishes, more bus routes are opened. However, the initial planning can’t accommodate these new additions, not enough space to setup the bus stops inside. Therefore, it expands outward to the public street. Even though only simple metal canopy structures are added to protect the users from the weather, they have impeded residents to use the street since the buses take over and block the street most of the time. Consequently, traffic congestion happens all day till midnight.

From the middle of Chung-I Road turn south leads to the official starting point for Highway 1. Therefore, a lot of traffic comes up and down the ramp and adds more congestion to the bus/train station area. Especially, during the rush hour, the whole zone becomes a parking lot. If one can discard this traffic problem, the view, especially coming down from the ramp, is spectacular because one can see the entire harbor and the site clearly. The first cross road from Chung-I Road to the east is Chung-Cheng Road, which becomes the coast highway that leads to many breathtaking sceneries. One will pass by City Hall, Main Post Office, City Cultural Center, and Naval Base. Thus, a lot of government-related activities, such as protest, happen here. Recently, a 35-story tower, with the hope to become the new city landmark by being the tallest skyscraper, has
been built across the cultural center. To break up the traffic to CBD and the coast highway, a second Highway 1 ramp, which directly leads to Chung-Cheng Road but cuts through some quiet residential area, is added to the area. Even though this has eased the traffic flow to the CBD, the living quality has declined because of the noise increase.

Behind the Main Post Office is the famous Night Market. The Fish Market locates west of the second ramp and south of the harbor. Their development and analysis will be found in the next section.

Another important feature in this area is Tien-Liao River, a major water element runs through the city. The river has been altered and paved like the bayous in Houston. It used to be fun to come to this river and play in it. But, due to severe pollution, water has become mirky and sometimes even smelly. Recently, Keelung government wants to start beautify the city to increase the tourism. The area along the river is the phase one renovation. Cleaning up the water, planting trees, creating sitting areas, and providing parking spaces are just some of the first implementations.
Night Market
Almost every city in Taiwan has a night market, and most of them are simply what the name suggests. The one in Keelung is famous because of its historical background, formation, and variety. Keelung’s night market in Chinese is called “Miou-Ko”, which means the mouth of a temple. The temple is called “Dien-Ji Kong”, that was originally built in 1875. It was the religious center of the town and acted as a major public gathering space. When there was any celebrations or important holidays such as Chinese New Year, festivals would held there and attract all the town people. Consequently, temporary vendors would come and start selling food and other necessities to earn some extra income. Gradually, some of these became permanent, and people started to come periodically, not just during the festivals. During World War II, because the temple was partially damaged, the market was forced to close down. Immediately, after the war, because Keelung harbor grew exponentially, more and more people were coming in. Also, the temple was rebuilt and remodelled. As a result, Miou-Ko Night Market came alive again and is still thriving
today. In order to organize the entire market, the government has legalized this section of the city to be used by the vendors and taken control the overall management.

The original Night Market is only the section in front of the temple and in this section, the city has provided each vendor with a light-frame covered booth and uniformly numbered signages. This part consists almost 70 stalls. Some open at 7 am and close at 9 pm; others start at 11 am and finish at midnight; a few even operates from 11 pm to 4 am. Even though each stall has different operating hours, 90% of them open at night. Thus, one can easily find something to enjoy almost 24 hours.

However, the newly added section, at the cross road which is three times larger, doesn’t have the permanent stalls. Thus, they can’t operate during the day. These vendors only come out and setup their booth after the traffic is closed off after dark. At night, both sections become a pedestrian-only zone. Overall, Miou-Ko Night Market has about three hundred to four hundred different kinds of food, including seafood, noodles, desserts, rice, sandwiches, and a lot more that ranges from Japanese, Taiwanese, Cantonese, and even American. Thus, this Night Market, even though compare to others on the island, is small, its content is what attracts thousands of visitors to come every month.
This Night Market expands from the plaza of a temple onto the surrounding street. Ultimately, the temporary food stands integrate with the existing building structure and become connected parts of the area. Temporal objects become permanent. They carve out a zone between street and storefront. This zone consequently affects how the storefront and the street function. The business hours for the stores respond to the fluctuation of the market. The street opens in the daytime and closes at night for the market usage. Thus, at night, street market, and stores become one single unit pedestrian plaza. The space people can use doubled in width. Densification of the activities occurs spontaneously.
Fish Market

Keelung has northern Taiwan’s biggest fishing industry, and “Kom-A-Dien”, the ancient name for this area, Fish Market is the busiest and oldest fresh seafood market in the city. Before the mid 1900’s, the market locates next to a river, where fishing boats could dock and directly unload the catch. Now, the river has been covered up, but the location of the market remains the same.

Thus, small trucks and carts are the main transporting vehicles. Currently, there are about 40 seafood wholesale stores, tightly lined up along two blocks, which is about 200 m long, and one block away from the harbor. Fresh and live seafood from saltwater, freshwater, artificially bred, imported frozen crab and lobster from San Francisco, Alaska, Boston or Japan, and many other varieties can be found in the market with an extremely low price. This is what attracts people, including restaurant owners, fish merchants, and general public, from all over Taiwan to come every morning.

At about 1 am, when everyone is deep asleep and most stores close the business, the Fish Market is just about ready to begin its busy schedule for the day. Trucks loaded with fish and ice begin arriving the area to start unloading
using carts. Then, the workers start setting up each individual area by staking all the goods in an organized manner and adding lighting fixtures on the sidewalk to light up the area.

At 4 am, the market officially open to business. At this time, the vendors will separate the fish into baskets according to the grade and size. The sale process is similar to an auction. The vendor will start calling out a price for each basket and whoever wants that basket will have to bid for it. This whole process is very fast, loud, and crowded. Most of the customers who do fish-related business will buy a huge quantity. Because the people and the trucks have taken the street, to transport these sold goods is difficult using cars. Thus, pushcarts or rickshaws become the best tool.

At about 7 am and the sun begins to come out, the Fish Market slowly shuts down. The workers will wash and clean the sidewalk and the street. Then, the stores will remain close and these two blocks will stay quiet till 1 am and the whole cycle starts again.
Fish Market develops because the passerby and customers are attracted to the wholesale stores to watch the unloading of fish products at storefront every morning. Thus, the idea of just setting up sale stand at the unloading trucks can eliminate the time and labor of moving the products inside the store. In addition, the store has extended the storefront to the street and sidewalk to capture more attentions. Therefore, during their business hours (4 am to 7 am), the store will display the fresh fish and other seafood on the sidewalk for the passerby and clients to choose. As a result, the pedestrian walkway is taken by and fully occupied by the merchants. Thus, because of this displacement, people use the street. Due to the early hours of operation, automotive traffic is scarce.
Concept
A rigidly-defined railing around the harbor edge creates an intimidating barrier for the pedestrians to approach the water. To breakdown this barrier, and make the edge softer, extension to the water and developing a more fluid movement for the area can make the space more enjoyable and friendly. The extension is an elongation of the existing city grid, which terminates above the water surface with enlarged platforms. The fluidity can be stimulated by implementing a more flexible way of travelling from one end to another (a more circular path). Looking at the existing situation, three main nodes can be identified: two skywalks and the bus/train station. The skywalks only function as linkages from one side to another for pedestrians. The structure itself serves as the backbone for the signages, and its massive appearance has dominated the area, blocking views toward the ocean. The bus/train station has transformed into many functions due to
decreasing number of passengers (comparing to ten years ago, when private automobiles were scarce). Thus, except leaving the basic passenger waiting area untouched, all the other spaces have been rented out to private business, such as 7-Eleven, fast food stores and coffee shops to increase the revenue. Because of these new additional functions, a lot of gatherings happens there. From understanding these three nodes, the main goal for this proposal is to link the nodes with its unique character. Also, the flexibility to accommodate expansion and contraction of this new construction is particularly important because it will transform over time. In addition, more interactions between street level, upper level, and lower level will be established. Consequently, these levels become the basis for the layers in the FLUID LATTICE.
Program

The FLUID LATTICE, besides serving as linkages from place to place, has another important function, providing spaces to the vendors or small business, which help maintain the structures. These spaces are separated into four types: 1/2 & 1/2, temporary, permanent, and sidewalks & platforms.

Most of these are food stalls. Even though the activities are temporary, the structure itself which is analogous to a storage unit, is a permanent establishment that incorporates with the LATTICE. All of the equipments for the vendors to set up the business are stored in it. The signages are left fixated or hung visibly for the passerby to see. The approximately 260 cm x 200 cm modules are placed back to back to share the plumbing and electrical hookups. At the back of the stalls, a service path needs to be created for transporting. Each stall will have its unique quality due to different cooking styles, and types of food. This adds vitality to the simple LATTICE structure. Also, the transformation from the boxed storage units to these wide-varieties setups signal the opening of the business and consequently causing the area to become densified.

The above diagram shows how this transformation occurs. The space it occupies expands and contracts according to the cycle of the business. Tables and chairs are stored in the permanent unit.
Temporary

Looking at existing city activities, there are many inventive vendors that transform the ordinary sidewalk to display their merchandises. About 80% of them sell clothing and accessories. Thus, the most common technique is to set up a temporary foldable wireframe structure for hanging and displaying. Also, sometimes circular racks or flat plywood tabletops are crammed inside an approximately 120 cm x 400 cm space. As pedestrians pass by, they can immediately glance at the selections. The vendors carry their goods in plastic bags, cardboard boxes, or suitcases. The other 20% sells food, such as fruits, snacks, cakes, and vegetables. They use carts to pull around. These “temporary” vendors don’t leave any traces of their setups at the end of the business day. When they are gone, the place will return back to a pedestrian-only sidewalk. For the LATTICE, specific places will be allotted for these kind of business. For their convenience, trellis, similar to the wireframe, will be provided. And these trellises can help variations on LATTICE’s elevation.

[Diagram of Rented Space, Permanent, Temporary]
Permanent

Compare to the food and temporary vendors, these are considered to be more high-ended permanent shops, usually brand-name stores such as Esprit, Addidas, Nike, and designed jewelry stores. The typical space is 500 cm x 200 cm, consisting of a storage area at the back. Each shop has its own specific interior design. Most of the spaces will be filled either by display cases or counters. For clothing vendors, to maximize the display surface, levels of shelves are mounted on the wall and racks are carefully spaced on the floor for customers to meandering around the shop. Sometimes, the vendors will move the items outside of stores as a technique to attract more customers; Cafes will set up sitting areas on the sidewalk to expand their capacity. These stores are permanent part of the LATTICE. Various sizes can be assembled from the typical module. Two-level shop is also a possibility. Other permanent enclosed spaces in the LATTICE are rest areas for the pedestrians, gathering or picnic areas for the tourists, or conference rooms for business people.
Sidewalks & Platforms

The LATTICE is made up mostly by walkways and platforms. All the program pieces are plugged into this primary system. Along the walkways, some specific places will widen to become platforms for gatherings. Variable widths can help promote different kind of activities, such as outdoor sitting areas and vista points. When one travelling or strolling down, he or she will be exposed to many experiences, like food vendors, jewelry stores, vegetable merchants, or open view to the harbor. Instead of a long corridor, these “distractions” will make this journey more exciting and interesting.
Schemes

The followings are five different configurations of the FLUID LATTICE. All have similar ideas and intentions. The fifth one, scheme E, has been developed more thoroughly, however, the elements can also be used in the other four schemes. Red in the model represents the layer above street level; white means on the street level; yellow symbolizes under the street level with association of the water element.

Scheme A

Starting with the upper red layer, it acts as a connecting device from the existing city fabric to the harbor edge. The skywalks can be modified to become directly connected with the second level of the buildings. In addition, a major connection to the bus/train station at right is established.
Also, the middle section, which is a major thoroughfare for the traffic, extends out into the harbor to create a platform for cars. For the white layer, which is primary for pedestrian use, a curvilinear path is proposed to lead people directly from one side to another. The yellow platforms added along the water edge below the street level, above the water level to create an opportunity for people to escape from the street noise and go nearer the water. A major platform in the middle of the water provides another kind of experience for the users.

Scheme B

Using the same idea as scheme A, this one proposes that the upper red layer should suggest some linkages with left side of the harbor. The white layer now becomes a more circular path.
This path wraps around the hard edge of the harbor and takes the pedestrians to different levels of the LATTICE, on the water, below the street, on the street, and above the street. The wires represent the structural units that will be used to hold the LATTICE up and they also can become light posts and signage supports. With this structure, it's easy for the LATTICE to expand. This scheme suggests a more centralized core, due to the shape of the circular path, which can be interpreted as a starting point that everything else spreads out from it.

Scheme C

This is a simplification of scheme B. Instead of using both circular and straight passages, only straight ones are implemented. All three layers have similar configurations, like a pinwheel. The
upper layer extends to the water, the bus/train station, and the city fabrics. The yellow layer incorporates the existing river, which become one of the extensions. One long pier is the other extensions for pedestrian reach out into the ocean. The center point of the pinwheel is the platform on the water. The white layer will follow the yellow layer and remains a sidewalk at the edge of the harbor and the river. These extensions can become infinitely long as time goes on.

Scheme D

This scheme explores the idea of stepping layers of platforms together, accessing to different levels through a ramping system. More interactions among all three layers happen at the right corner, where the best view of the harbor is. Platforms are strategically placed to serve different func-
tions, such as boating dock, floating pontoons, restaurant on the water. This LATTICE can be built in phases. As time passes on, the place becomes more densified, then more parts of it will be added.

Scheme E

This scheme has developed more thoroughly. The following sections will describe it in detail about each different layers and functions.
Layer Systems

Creating a secondary pedestrian system to maximize the experience of this dense fabric and the limited waterfront is the main purpose of the FLUID LATTICE. Six major components of the LATTICE are: Waterwalk, Underwalk, Sidewalk, Upperwalk, Connections, and Structures.
Waterwalk

This describes the surfaces that are installed on the water using floating devices. These platforms can readjust themselves according to the water level. Each platform is assembled using 3' x 6' modules. And, the size can be readjusted if needed by adding or subtracting modules. Merchants and vendors can also occupy these surfaces to do business. For example, one can reserve a platform for a private party and food and drinks can be served by the caterers on the shore. In this case, it transforms into a gathering space. Waterwalk can also be used as boating docks. This will become extremely beneficial as Keelung develops its coastal tourism, which will attracts more leisure boats.
Underwalk
Since the street level is about 12’ higher than the water level, there’s a walkway in between them. Currently, it’s only wide enough to be a service way to repair the edge of the harbor. The proposal is to widen it to become at least 10’ and make it accessible to the public to escape from the street noise. Some parts can be excavated to create a space underneath the street level, and other locations can extends outward like piers. Adding steps leading down to the water can provide sitting areas. Business can open on the pier and those newly carved-out spaces. People who love fishing will enjoy this new addition.
Sidewalk

In order to beautify the existing sidewalk, the LATTICE will add stopping points, niches for gatherings to overlook the harbor. The width varies from sections to sections. This is a way to give back pedestrians a pleasant walkway. The spilling out of the stores create the necessary attractions for the pedestrians. Bus stops also help gather up the crowds. People will wait and shop or eat. Shaded areas are provided by the existing trees, which make the space more attractive. Ultimately, this is the level where one can either travel up or down and it will be the busiest layer.
Upperwalk

Linking the existing two skywalks with the buildings and stores at second level creates an ever-expanding walkways around the area, because if the pedestrians want to stay away from the traffic, they can use this route till they reach their destinations. Outdoor places are provided for viewing and relaxing. Great vista toward the harbor and the ocean, night light at dark, and seagulls flying in the morning are examples of sceneries. More storefronts are created because all of the second floor can have its own prominent front door facing the upperwalk or one story store can expand to two floors, attracting customers from both levels.
Connections
The main connection for the LATTICE’s layers is a ramping system. Since the ramps are at 1 to 20 slope, they are handicap-accessible. They connect directly with the sidewalk, which make the transition from one layer to another smoother than stairs. Because of the gentle slopes, pedestrians can slowly stroll along and enjoy the view. For convenience, three elevators are added to make transporting goods easier and faster.
Structures
The LATTICE will be made from a light steel frame in a 24’ module and attached to three concrete elevator cores to add more stability. This module is set up according to the typical sizes that vendors usually occupy. The two skywalks have different width due to different functions. But both of them, at the initial stage, only a 6’ wide floor surface will be provided for the pedestrian usage. Later, another 6’ to 10’ can be added to increase the width. This added width is for the vendors and stores to occupy. This ability to add and subtract floor area can change according to the densification of people.
The FLUID LATICE consists of three distinct but connected sections: Fish Node, Pedestrian Node, and Bus Node (from left to right). Fish node directly connects to the fish market which is one block down. During the market business hour, people can see the fishermen unloading their catch from the boat, and using the elevator or the ramps transporting the goods down to the shops. Pedestrian node is primary for people to enjoy the view, since it locates at the center of this harbor area. Bus node will be the most active area because activities happen all day long. While people wait for the buses, they usually want to grab something to read, eat, or play. Thus, this part of LATICE will consist the most stores.
Looking toward the LATTICE from sidewalk. The colors represents the three different sections.
Looking toward the Bus Node of the FLUID LATTICE from the bus/train station.
Standing at the Fish Node skywalk looking at the ramp system.
Fish Node 12' wide skywalk
- Pedestrian
- Fish Merchants
Related Asian City Literature

Waterfront Literatures


**Urban Design**


**Information on Taiwan**


**Information on Keelung**

1. [www.klcq.gov.tw](http://www.klcq.gov.tw)
   This is Keelung City government Information website. Most of the information about the city is from this web site, which consists of both Chinese and English version.

2. [www.tbroc.gov.tw](http://www.tbroc.gov.tw)
   This is the web site for Tourism Bureau of Taiwan. It provides general maps for different part of Island.

