

HABOR RECLAMATION:
CENTRAL AND WANCHAI DISTRICTS

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Abstract

The issue of land reclamation in Hong Kong, specifically for the Central and Wanchai districts is discussed. Through diverse methods of research, we analyzed the proposed plan by the government that will develop the reclaimed land and compared it to what the citizens and Non-Governmental Organizations of Hong Kong desire for the site.

Executive Summary

Land reclamation has become an important strategy for alternative urban planning. Countries or cities with exponential population growth and limited space may use harbor reclamation as a solution to the growing demand for land. Some major cities like Singapore, Boston, Macau and London have previously completed harbor reclamation developments, and Hong Kong is no different. The economy of Hong Kong has increased greatly in recent years which caused the business districts in Hong Kong to expand over time, creating more and more opportunities for financial success.

However, these factors have unfortunately caused an increase in traffic congestion around the main business districts, Central and Wanchai. Because of this issue, the government of Hong Kong proposed two land reclamation projects, one for each district, which will create an over ground, six-lane highway called P2, as well as an underground highway called the Central-Wanchai bypass (CWB) that will help alleviate traffic congestion. In addition to these traffic solutions, the government has also planned the development of several commercial and government buildings in the reclamation area, bringing more activity to the harbor-front.

The reclamation project for Central and Wanchai was divided into several phases. Central Reclamation Phases I and II, (CRI and CRII) have already been completed. Central Reclamation Phase III (CRIII) is proposed to serve the development of the bypass and is currently under way. The Wanchai district reclamation has two phases. Wanchai Phase I (WDI) has already been completed and Phase II (WDII) has been halted for revisions from the Town Planning Board. These reclamation phases form part of a master plan to create an open space that will contain a large concrete promenade with a waterfront view, commercial areas and government offices, while at the same time solving the traffic congestion problems with the CWB and P2.

The general public has expressed disapproval with the government's plan to build additional commercial and governmental buildings on the harbor-front. Not only will this add more than 1.2 million square feet of development to the site, but it will also generate more traffic in an already saturated area. The people consider the reclamation proposal of Central and Wanchai as a way for the government to profit from the sale of the land.

Through a variety of interviews and lectures with Civic Exchange in conjunction with several other key Non-Governmental Organizations (NGOs) that have been at the forefront of the battle against the government plan, we have managed to gather their thoughts and

criticisms on the major issues surrounding the development site. Their main argument is that the government can utilize the reclaimed land more efficiently by creating green, open areas with a reduced number of commercial and government buildings so that the Hong Kong citizens can treasure and enjoy their harbor. The NGOs have strongly criticized the government justifications for developing government buildings at the Central site stating that the government can refurbish their existing facilities so that they would not need new ones.

A group of NGOs, including Civic Exchange, the Society for Protection of the Harbor, and Save Our Shorelines, have released an alternate proposal that portrays the ideas they would like to see realized. The proposal, called Central Park, integrates the CWB but excludes the P2 highway. It also removes the government buildings and commercial developments from the site. Instead, it contains open green and blue areas for people to enjoy their leisure activities.

The business sector has also become involved in the debate. In particular, a development company called Swire Properties Ltd. has proposed their version of the Central and Wanchai Reclamation. Their proposal tries to integrate the best of both worlds by having the CWB, as well as a reduced number of government and commercial buildings, and at the same time designing large green areas and walkways for leisure activities. It also incorporates a cultural area for museums that the citizens would be able to enjoy. The Swire proposal has been viewed as “environmentally conscious” by the NGOs and succeeds at finding a middle ground between the two extremes.

From our research, the most probable development that will eventually proceed will be the governmental proposal. This is due to several factors. One is that the government has long adopted a harbor reclamation strategy in order to create revenue from its land sales. Another reason is due to the fact that by not being a democratic administration, they have no obligation to respond to protests or criticisms. Lastly, if they modify their plans, it may appear as a sign of weakness for not going through their initial plan.

However, the awareness effort made by the NGOs has increased people’s interest in having a say on the city projects and planning. Even if the government proposal proceeds, the Central and Wanchai Reclamation will have great influence in future project proposals from the government. As they might eventually realize, it is important to consider the people’s requests when it comes to urban development.

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CHAPTER 1: INTRODUCTION

What would happen to New York Harbor if the Statue of Liberty gradually disappeared, if the Eiffel Tower was slowly torn down, or how about if the Great Wall of China was steadily destroyed? If any of these occurrences were to happen, the aesthetics, or visual beauty, of those locations would be gone. And this would be a serious issue, as these items are what make these places unique. Now while these specific examples are not in any immediate danger of vanishing, other aesthetic locations in various parts of the world are.

One such location in danger of losing the aesthetics that makes it unique is Hong Kong's Victoria Harbor. The once "fragrant harbor" (Hong Kong stands for "fragrant harbor") is not fragrant anymore, at least not in a good way. With a current population of about 6.9 million people, the territory of Hong Kong is becoming increasingly crowded, and through this, many economic problems have arisen. Traffic chokes the island, both on the land and in the surrounding waters. Pollution fills the air. By use of landfills, as well as the constant overpopulation and traffic problems, the constant reclamation of land that began in the 1800's is slowly, but surely, causing the harbor to grow smaller and smaller. If this trend continues, Hong Kong's harbor will eventually shrink to become a river, along with the meaning of the island's name. These problems greatly endanger the aesthetics of the city.

Hong Kong think tank, Civic Exchange, is concerned about achieving good urban planning and design along the city's harbor-front. Our project looks specifically at one stretch of the waterfront at Central and Wanchai, which has had several years of controversy over the size of the government's reclamation plans, and now that the reclamation is near completion in Central, how the land could be used and developed. The controversy continues also over Wanchai since in reality the whole stretch of sea-front is short. The government's proposed construction of new highway systems and land development remain highly contentious between the government, professionals and community groups.

Although the issue of harbor reclamation in Central and Wanchai districts has been debated for quite a number of years, it was still unclear as to whether or not these planned phases should continue. The proposed construction of new highway systems in order to solve traffic congestion problems in the Central-Wanchai districts, as well as availability of new commercial land development, may help improve structure and growth in Hong Kong's business districts. However, many believe that these reclamation projects were causing the harbor to become unaesthetic land areas covered with highways. What needed to be done was to analyze the traffic congestion issues for the Central and Wanchai districts.

Our project goal was to first research the highly complex relationship between reclamation, land development, transport design and urban planning for the long term, second to determine the various proposed plans by the government, professional and community groups, and then third to come to some economic and socially valuable conclusions about the development of Hong Kong's harbor-front areas.

CHAPTER 2: BACKGROUND

In order for us to gain relevant information regarding our project, we divided it into six topics. In this section, we cover the following six topics, which are Hong Kong's economy, history of harbor reclamation, history of harbor reclamation in Hong Kong, Central and Wanchai reclamation, government development structure, and environmental effects. These topics provide significant information that improved our analysis of our overall project goal.

2.1 Hong Kong's Economy

Hong Kong is one of the major business centers of the world, serving both the national and international economy. Hong Kong's growing economy plays a large role in the demand for more land, which indirectly impact the need for harbor reclamation.

According to Hong Kong Background Facts (2005), Hong Kong was ranked in the top ten largest in both foreign exchange market and stock market in terms of market capitalization in 2004 (Hong Kong Background Facts, 2005). Hong Kong is a continuously thriving society, with new companies, and foreign direct investments being established. As of October 31, 2004, there were 53,268 new companies out of a total of 513,516 companies registered in Hong Kong. Out of those new companies, 606 companies are overseas companies, which brought the total of such foreign-owned companies to 7,244.

Hong Kong also has one of the busiest ports in the world (Hong Kong Background Facts, 2005). It is located near the Pearl River Delta which is one of the entrances into China. Hong Kong, in 2003, was the world's busiest container port with 20.4 million Twenty-foot Equivalent Units (TEUs) of containers. As of October 2004, the Hong Kong Shipping Register had registered 992 vessels with a total gross tonnage of 24.9 million.

A major source of revenue in Hong Kong is tourism. There was a decrease in tourism during the SARS outbreak in 2002 (Hong Kong Background Facts, 2005). However, according to Hong Kong Background Facts (2005), after 2003, the tourism industry began to recover. During the first nine months of 2004, the arrival of visitors grew by 52.1% year-on-year to over 15.7 million. More than half of the visitors were from Mainland China with a total amount of around 9.98 million visitors.

Hong Kong is constantly growing in its economic status. The increase in foreign investment and widespread tourism also displayed how the rest of the world views Hong Kong. With the perpetual demand for more space and the increasing threat of air pollution,

Hong Kong is in need of dramatic solutions to combat these ever-growing concerns. The use of harbor reclamation became an easy solution for the government to overcome the problem of land limitation.

2.1.1 Central and Wanchai Districts

The Central and Wanchai districts are the major business centers on the Hong Kong Island. Figure 1 is a map of where these two districts are located. These districts are located on the northwestern part of Hong Kong Island, and form part of the historical land mark, Victoria Harbor. As you can see, the density of the streets located near the shores of the harbor is where the business centers of Hong Kong are located.

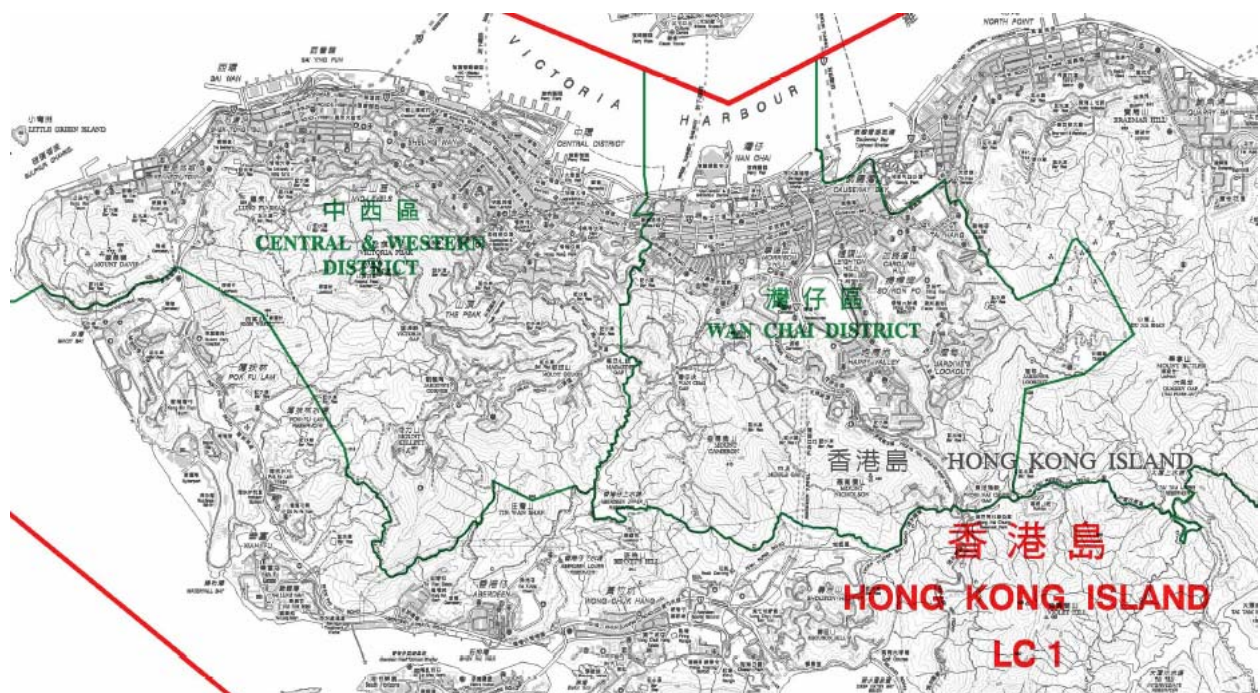


Figure 1: Location of Central and Wanchai Districts (Legislative council, 2004)

The amazing skylines of the harbor at night, give Hong Kong the nickname “the Pearl of the East.” The need for additional land in this district was apparent as early as the 1920s. In one article, Winston Chu noted that Victoria Harbor’s original size was about 6,500 hectares, which equals to about 16,061 acres in size (2003). By 1990, about 40% of the harbor had been reclaimed, with an addition of 661 hectares reclaimed by 1995. Now, less than half of Victoria Harbor remains and there are plans to further reduce it with more harbor reclamation.

2.2 History of Harbor Reclamation

The process of reclaiming harbor property has been around for more than a century. It is a means of expanding an existing city space because of increased population growth. There are cities that have utilized harbor reclamation in the past such as Boston's Back Bay landfill that was completed in 1890. This project expanded 231 hectares of the harbor and has currently grown to be one of the most fashionable areas in Boston (Boston History and Architecture, 2005). Singapore and Macau are among other places that have actively participated in harbor reclamation projects (Karakiewicz and Kvan, 1997).

There is an important increase in harbor reclamation in Asia with important port countries like Malaysia and Hong Kong Special Administrative Region (HKSAR) leading the way (Karakiewicz and Kvan, 1997). Malaysia alone has scheduled 1,214 hectares to be reclaimed along its coast, confirming that Asian port regions are relying on harbor reclamation as a tool for achieving urban development.

2.3 History of Land Reclamation in Hong Kong

The issue of reclaiming land in the Hong Kong harbors is not a new approach for the city of Hong Kong, as its government has had a land reclamation strategy since the early 1920s (Harbor Protection, 1998). The government's justification for harbor reclamation was that the reclaimed land will tailor to the fast population growth as well as an expanding economy. Currently, land reclamation in the Hong Kong harbor is still very active and is a major issue of concern for both the government and the citizens.

The proposed strategy implicates reclaiming land in several key areas of Hong Kong (Harbor Protection, 1998) which tailor to different needs of the population. One major factor that influenced the distribution of proposed land was the shipping and port industries because of their importance to the city's economy.

According to Loh, who is an active advocate of harbor protection in Hong Kong, the government could have developed the New Territories more sensitively instead of relying on harbor reclamation, as there is a lot more land available there. However, the reasons why the Hong Kong government chose to reclaim land instead of developing the New Territories are largely because of land revenues for the government (Loh and Citizens Party, 1997). The land that the government reclaims from the harbor has no previous owner, which means that the land is wholly owned by the government, and it will keep all of the revenues from the sale and lease of the land. On the other hand, if the government was to develop the New Territories, it would need to buy the land from villagers, which requires more time and effort.

The government estimated that it would make HK\$94 billion more from a massive harbor reclamation strategy than from the urbanization of the New Territories.

Another of the financial benefits that harbor reclamation brings to the government is that it is also an economical and fast method to alleviate the population growth in Hong Kong (Loh and Citizens Party, 1997). It is an effective process because the communities adjacent to the proposed reclamation already have a complete infrastructure. They enjoy the benefit of a close proximity to waterfront views that sell for large premiums, as they can be categorized as prime real estate.

The map in Figure 2 displays the gradual increase in harbor reclamation in Hong Kong since 1945, and also presents the further proposed reclamation mainly in the areas of Kowloon, Victoria Harbor and the Western Districts.

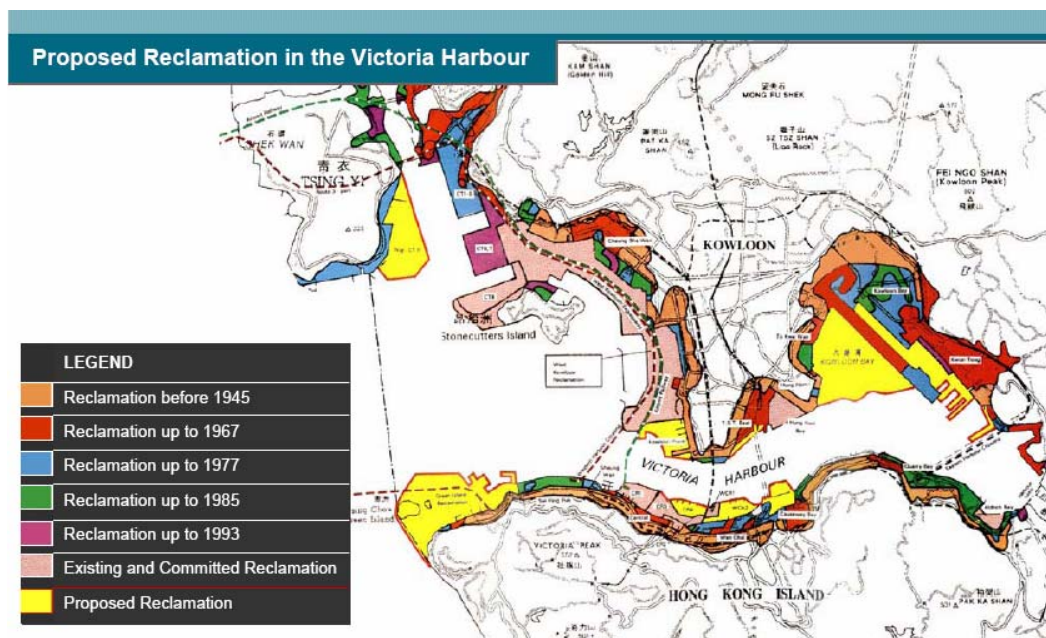


Figure 2: Proposed Reclamation in Victoria Harbor: 1945-2005, for Protection of the Harbor Limited Society (Harbor Protection, 1998).

2.4 Central and Wanchai Reclamation

The decision from the government to approve the land reclamation project for the Central and Wanchai districts came as a result of several studies focusing urban growth and territorial development strategies. These studies that began in 1983 and were finalized in September 1989 (Harbor Protection, 1998) forecasted that traffic congestion in the area would become unsustainable for Central and Wanchai and recognized that a solution would be needed. The initial proposal was to reclaim 108 hectares between the Central and Wanchai

districts waterfront in order to provide sufficient land for a bypass that would alleviate traffic congestion in the mentioned districts.

The initial project was divided into districts and furthermore it had several phases within the districts (Legislative Council [LegCo], 2003). The reclamation project for the Central district contained three phases which identified several objectives that would be carried out in each phase, among which was the proposed bypass. The Wanchai district reclamation was divided into two phases which focused on developing transportation infrastructure as well as some commercial developments.

2.4.1 Central Reclamation Phases

The three phases were:

- Phase I (1993-1997): Involved reclaiming 20 hectares that provided extended land for the central business district as well as the Central Station for the airport railway. Development started in 1993 and was completed in 1998 (Legco, 2003).
- Phase II (1994-1997): Involved reclaiming 5.3 hectares for the commercial and open development of the Tamar Basin area. Development started in 1994 and was completed in 1997.
- Phase III (1997-present): Initially involved reclaiming 32 hectares for the Central-Wanchai bypass and other infrastructural buildings, but was later reduced because of the Protection of the Harbor Ordinance that was introduced in 1997 which transformed the proposal and reduced the reclaimed land to 18 hectares. The new proposal involved the creation of an underground bypass and the use of the land will consider the environmental impacts the development could have on the harbor.

In Figure 3, phase III can clearly be observed in the proposed Central reclamation, where the projected bypass (Yellow) will be underground, and the proposed P2 (Pink) highway will be a six lane over ground highway (LegCo, 2003). The addition of these two highways will fit into the existing traffic system of Central and Wanchai districts, easing traffic congestions in the main Connaught Road (Green).

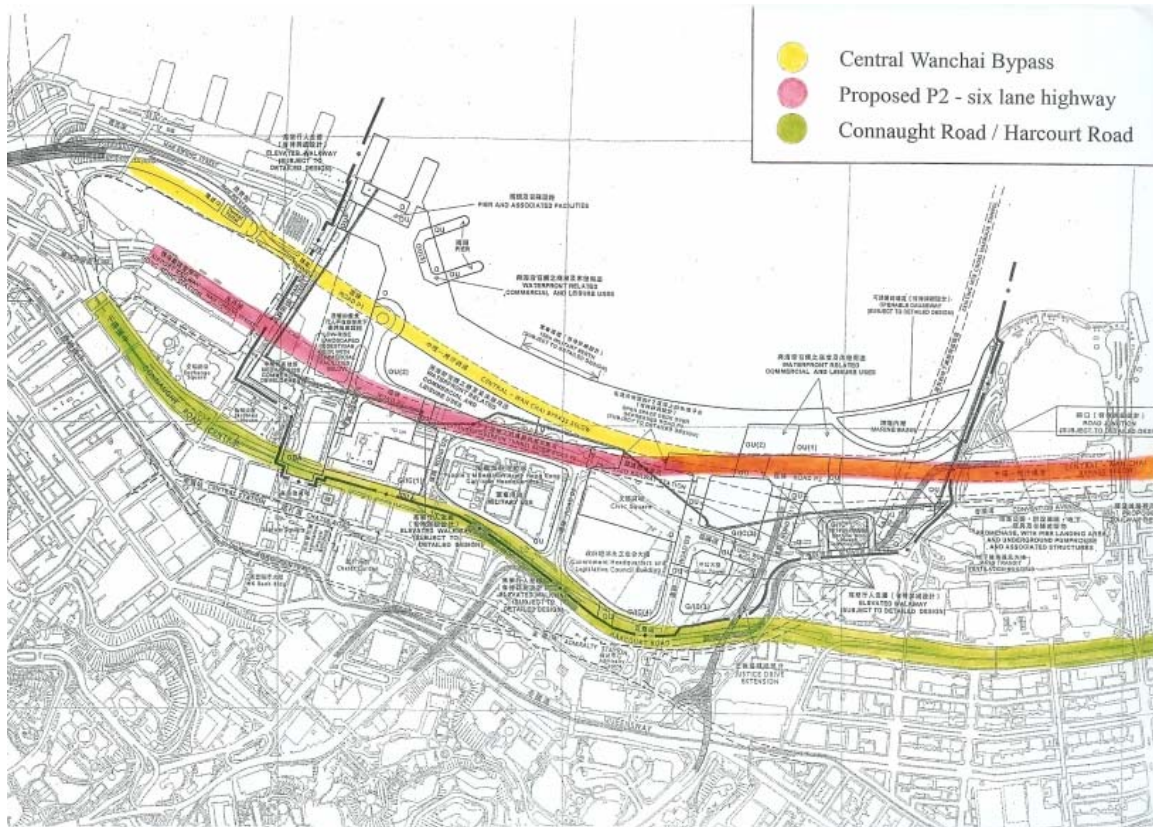


Figure 3: Proposed Bypass and P2 highway system, (Harbor Protection, 1998).

2.4.2 Wanchai Reclamation Phases

The two phases were:

- Phase I (1994-1997): Involved the development of the Hong Kong Convention and Exhibition Center, which was a joint project of the Hong Kong government and the Hong Kong trade development council. Development started in 1994 and was completed in 1997 (Legco, 2003).
- Phase II (1997-present): Initially involved reclaiming 48 hectares of land for transport infrastructure, a recreational park, hotel and residential developments, but was later reduced because of complying with the Protection of the Harbor Ordinance. The new proposal involves reclaiming 28.5 hectares and is focused on the development of transportation infrastructure.

The map in Figure 4 displays all phases of the Central-Wanchai reclamation and how it is structured. The Central Reclamation Phases I and II, as well as the Wanchai Reclamation Phase I, have been completed, while the Central Reclamation Phase III and the Wanchai Reclamation Phase II have yet to be finished.

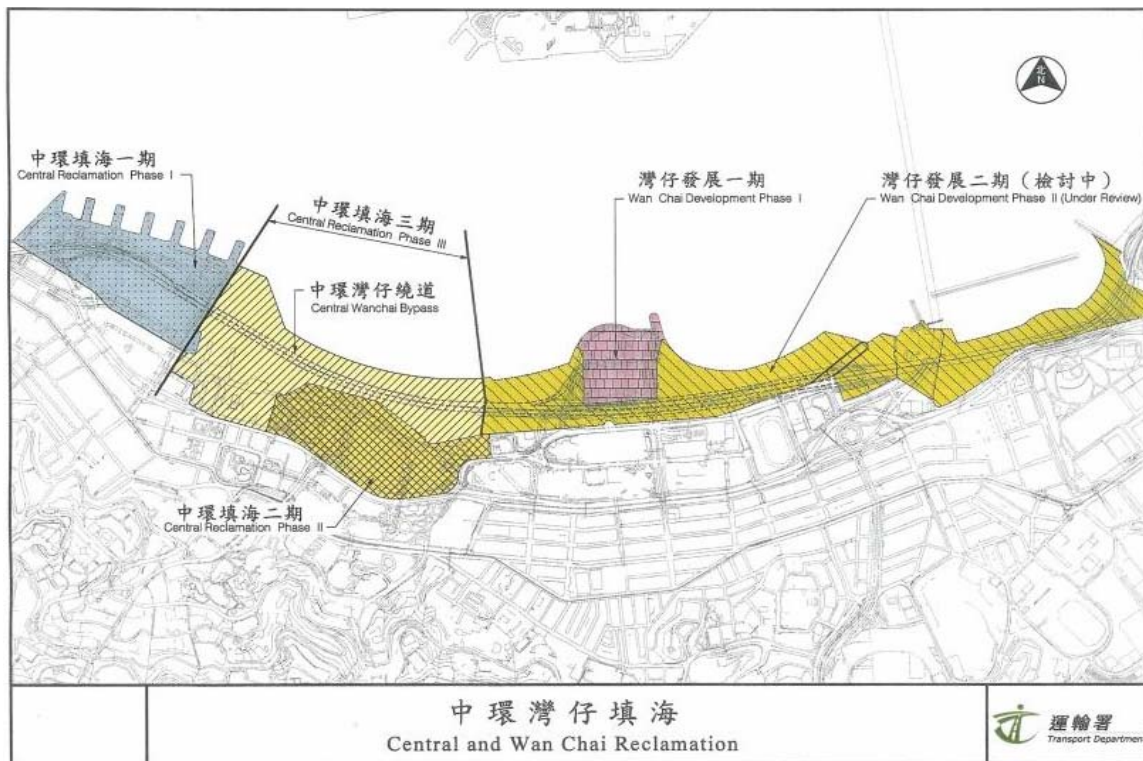


Figure 4: Central-Wanchai Reclamation Phases, (Harbor Protection, 1998).

2.5 Government Development Structure

The government asks developers to present proposals for the reclaimed land (Loh and Citizens Party, 1997). After considering all the proposals, the government decides which developer will carry out the project with the best quality and most cost-effective strategy. The government usually gives the contracts to one developer in order to avoid the risk of having undeveloped lands or an unorganized creation of the properties.

The HKSAR government relies on the financial profits coming from the lease of the land as well as benefiting from an improvement to the quality of life in the city. As in other countries, the policy making decisions of these large projects and decisions have been influenced by parties that could benefit from the reclamation projects. The built-environment professionals and property development sectors in Hong Kong are powerful entities and benefit greatly from the ongoing harbor reclamation (Loh and Citizens Party, 1997). As waterfront land is susceptible to inflated prices and maximum profits for both the government and developers, there is usually much interest in reclamation and related infrastructure projects as well as in the prime land that is created for property development.

2.6 Environmental Effects

Air pollution has been affecting the quality of life in Hong Kong. Sources range from industrial facilities to typical local traffic. Governmental actions towards a better Hong Kong are viewed differently from environmental groups. Local citizens and widespread environmentalist groups are trying to persuade the government to improve the air quality and balance out the land and harbor reclamations in Central and Wanchai Districts. Other Asian countries such as Singapore have had similar air polluting situations but have strived to better the conditions, while Hong Kong is still in the process.

Air pollution has been significantly growing over the past few years in Hong Kong (Walsh et al., 2004). On August 19, visibility was so bad that eight ships had minor collisions in smoggy Victoria Harbor. The city has already had more than 80 days this year when at least one air-monitoring station registered a "very high" reading, compared with just 53 days in 2003, and the level of tiny, breathable particulates in the air is frequently up to twice the safety standard in the U.S.

A simple aspect of life, breathing, is beginning to become an issue in Hong Kong where residential health will be affected (Walsh et al., 2004). Standards for air quality in Hong Kong are lower than the United States' standards. Hong Kong's monitoring systems have been reading high levels of dangerous particles in the air that have caused certain area residents of Hong Kong to stay indoors. Compared to the United States, Hong Kong's air quality levels are about three to four times higher than the United States' safety levels. It has affected adolescent children more, rather than adults, because of their less developed respiratory systems.

One factor that lead to these kinds of incidents are the tall buildings surrounding the areas of the cities ("Stop and rethink Tamar," 2005). Tall buildings affect the air circulation in which polluted air permeates throughout the inner communities without being revitalized. The Stop and Rethink alliance states that the air pollution in Central would worsen if the new government offices were built at the Tamar site. The government's pollution model of Central portrays the land to be a flat surface. In effect, this model disregards the pollution that gets trapped in by the tall buildings around Central. Pollution predictions have been based on 1999 data and the notion that Central had no buildings. This would mean that the pollution levels attained were underestimated and a new evaluation should be made.

Emissions from local vehicles are not classified as a major source of the air pollution but are contributing factors to the increase in air pollution. Traffic congestion within the

Central and Wanchai districts is heavy, and vehicle exhaust is spreading throughout the inner cities. To compensate for the poor and low quality car fuel, taxis are using Liquefied Petroleum Gas (LPG) as a source of fuel, which is cleaner than gasoline (Loh, 2004). Although this may be some improvement, the implementation of the highway systems are still issues that environmental groups are looking at where there will still be vehicles traveling along the roads.

Many believe that the government is not doing its best to improve safety regulations on air polluting factories and power plants.

A survey last month of Hong Kong professionals and managers found that 84% believed the government was not doing enough to protect the environment (Walsh et al., 2004)... China's local environmental agencies are notoriously weak, and the central government provides just 10% of their budget; the actual authority and most of the funding for pollution protection rests with local political officials... Penalties are so low that it's not uncommon for polluting factories to keep paying fines rather than install expensive cleaning equipment... 'There's no incentive or disincentive to change behavior...' 'It's just easier, faster and cheaper to do it wrong. Then you pay the price later.'

The government does not have enough incentive to provide better working conditions in these kinds of facilities. As much as the budget goes, the government seems to be preoccupied with developing and expanding the economy and businesses.

2.6.1 Non-Governmental Environmental Organizations

Steps to a solution have been made and are in the process of taking action. Citizens of Hong Kong have filed lawsuits against the government to force them "to live up to it's often hollow environmental pledges" (Walsh et al., 2004). Environmental groups have met at the Better Air Quality workshop to discuss plans and policies to convey to the government to improve the conditions of air quality.

The Society for Protection of the Harbour (SPH) is one of the non-governmental organizations that have protested against the government's proposals on reclamations ("Central Reclamation and Post-Reclamation Development," 2004). On September 8th, 2004, SPH stated in a press release that "the land created from reclamation should be used to create a signature public space as a legacy for Hong Kong as a whole" (Joint Press Release, 8 September 2004). This would in fact lead to bettering the quality of life in Hong Kong instead of piling up commercial buildings and adding on extra highway systems around the

cities. “The SPH proposes that the size of the reclamation can be reduced and for the reclaimed areas to be used to create a large and lush park that will become a defining, signature space for public enjoyment”.

The Society for Protection of the Harbour (SPH), Save Our Shorelines (SOS) and Clear the Air (CTA) have come together and proposed three ideas that expert studies support and reflect the public’s view on how the CRIII development should be modified (“TPB meet again,” 2004):

- SPH’s submission calls for reducing the size of the reclamation, reducing the size of the P2 road networks and objects to major commercial developments allowed under the CDOZP.
- SOS urges a 70% reduction in the current zoned reclamation through using an immersed tube tunnel to build the Central Wanchai Bypass, and a substantial reduction in the P2 road networks.
- CTA proposes an immediate implementation of Electronic Road Pricing to reduce traffic congestion thereby lessening the need for new roads

These proposals reflect the traffic congestion that Central and Wanchai districts are dealing with. Although these were worthy proposals, the Town Planning Board rejected them without any supporting reasons and disappointed the organizations (“TPB meet again,” 2004).

Non-governmental organizations and groups have been continuing to protest against projects that try to hinder the aesthetics of Hong Kong and the residential life. The Central and Wanchai reclamation project is currently undergoing modifications to comply with regulations and satisfactions of these organizations.

2.7 Traffic Congestion Case Studies

Hong Kong is a major commercialized city with an expanding economy. Traffic congestion is an issue that has been around for quite some time. Electronic Road Pricing (ERP) has already been introduced in several cities around the world. The following case studies of Singapore and London are examples of cities that have implemented this kind of solution for traffic congestion.

2.7.1 Singapore Case Study

Singapore has also been undergoing problems with traffic congestion. In the past, they executed a four fold operation to alleviate their traffic congestion (Toh, 1977, p. 52). A

curbing of car ownership was dealt with by increasing the purchase and ownership costs of automobiles through tariffs. Also steps to develop better public transportation were taken into consideration to encourage its use. To make Singapore's roads more favorable to accommodating traffic, improvement on the management of the roads were being put into plans. Lastly, on June 2, 1975 an Area Licensing Scheme (ALS) was enacted.

ALS defines a restricted zone in the Central Business District (CBD) containing a land area (Toh, 1977, p. 53). It restricts the use of the roads in the CBD between certain hours of the day. Only specific cars that display a license are allowed to drive through the zone. The license could be purchased on a daily basis for three Singaporean dollars (S\$3) or a monthly basis of S\$60. Unfortunately, company cars were charged twice the residential rate for a license, while buses, service and military vehicles, carpools and taxis were all exempted from the scheme and could move freely within the CBD.

This kind of regulation was the first of its kind done anywhere in the world (Toh, 1977, p. 54). The Area Licensing Scheme successfully reduced traffic congestion significantly during the peak hours. Around the fourth week of the ALS, traffic flow had fallen by 45.3% which contributed to the 76.2% reduction in the number of vehicles in the CBD. Public transportation also increased from 35.9% to 43.9%. Although these improvements were showing effective numbers, it was found that there were "escape corridors" around the CBD. Individuals have avoided the restricted hours by traveling before or after them and traveled on alternate routes. Soon after, taxis were taken off the exempted list and resulted in a backfire against the scheme. To accommodate for the increase in traffic flow, the traffic lights were reset to deal with the "escape corridors" situation.

In 1989, in effort to strengthen the results of the ALS, the Singaporean government modified the program by lengthening the restricted hours to afternoon rush hours and took the following cars off the exempt list: car pools, private and school buses, commercial vehicles, and motorcycles (Toh, 1992, p. 298).

The Singapore Area License Scheme has been a worthy case study in analyzing alternative solutions for traffic congestions. It has been successful in its implementation and might contribute to Hong Kong's traffic congestion situation.

2.7.2 London Case Study

London, like many other major cities around the world was faced with a major problem with traffic congestion. Mayor Livingstone proposed a charging scheme to alleviate traffic congestion, and encourage people to use public transportation. The basic plan was

accepted in February of 2002, and on February 17, 2003 the fee was introduced to the general public.

The basic premise of the plan is to charge a fee for vehicles to enter the charging zone at a daily rate during certain time periods of the day. The London's charging zone is shown in Figure 5. To enforce this plan, there are around 203 sets of congestion charging cameras on the boundary and within the charging zone. The cameras will use automatic number plate reading (ANPR) technology to record the number plates of vehicles in the charging zone with a 90% accuracy rate (Transport for London, 2005a). The main focus of the cameras is to take pictures of the license plates of the vehicles, which it will then send the data to the command center. There, they use an automated license plate recognition system to match the plate to a list of registered vehicles. If the match is not found, the data will be compared to a database provided by Driver and Vehicle Licensing Agency (DVLA), based in Swansea. The owner of the vehicle will then be fined.



Figure 5: Map of London's Charging Zone (Transport for London, 2005c)

In the Third Annual Report conducted by Transport for London (2005c), there is an overall reduction of congestion by 30%.

Figure 6 displays the amount of traffic flow before and after the charging period. There was a significant decrease in the amount of cars traveled in the zone after the charging period started. Also, the amount of traffic flow under the other divisions stayed relatively the same, with the exception of an increase in taxis.

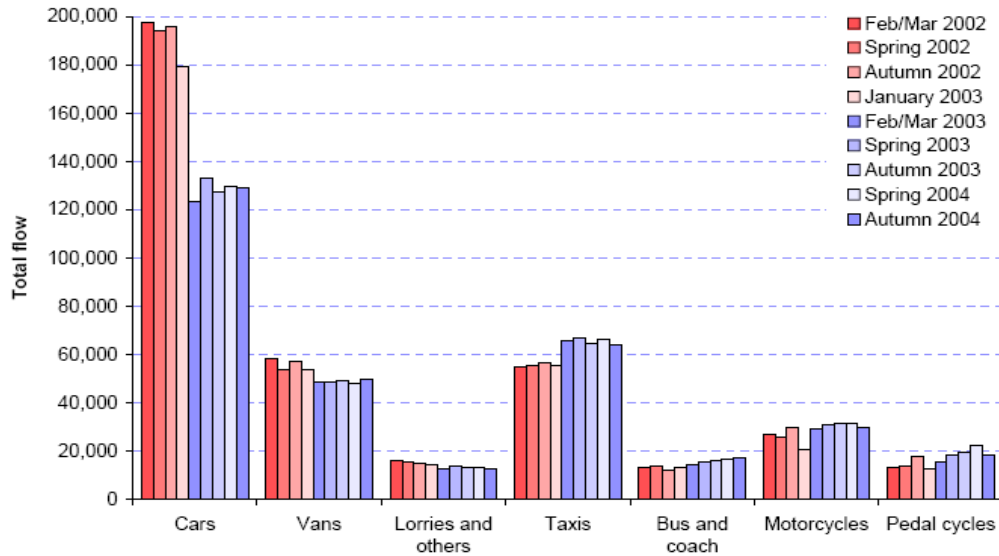


Figure 6: Traffic flow in the Charging Zone (Transport for London, 2005c)

Figure 7 shows the change in inbound and outbound traffic in the charging zone. When the plan was first introduced in 2003, overall inbound traffic dropped 14% compared to 2002. There was a noticeable increase in vehicles that were exempt from the charges, which included taxis, buses, motorcycles, and bicycles.

Vehicle type	Change in inbound traffic 2003 versus 2002	Change in outbound traffic 2003 versus 2002	Change in inbound traffic 2004 versus 2003	Change in outbound traffic 2004 versus 2003
All vehicles	-14%	-18%	0%	-1%
Four or more wheels	-18%	-21%	0%	-1%
Potentially chargeable	-27%	-29%	-1%	-2%
Cars	-33%	-35%	-1%	-2%
Vans	-11%	-15%	-1%	-1%
Lorries and other	-11%	-12%	-5%	-5%
Licensed taxis	+17%	+8%	-1%	0%
Buses and coaches	+23%	+21%	+8%	+4%
Powered two-wheelers	+12%	+5%	-3%	-4%
Pedal cycles	+19%	+6%	+8%	+8%

Figure 7: Traffics Entering and Leaving the Charging Zone (Transport for London, 2005c)

Overall, the London's Charging Scheme accomplished its reducing traffic congestion plan in Central London. The opposition of the plans was much fiercer in the beginning compared to the present. The net revenue from this project went directly into improving the transportation in London, for example, improvements in the bus systems and other public transportations (Transport for London, 2005c). The oppositions lessened as the goals of the plans slowly materialized.

London is the largest city to date that implemented a charging scheme to reduce traffic congestions. There are pros and cons to London's plan and the scheme is under constant revisions. The knowledge gained from this case study could help to design a similar plan for Hong Kong to reduce traffic congestion. It would act as an alternative to building the proposed highways.

To understand why the government is intent on land reclamation requires knowledge of Hong Kong's economy. Previous developments of harbor reclamations by the HKSAR government are to be viewed in analyzing the Central and Wanchai reclamation. The business structure of Hong Kong is one of the key factors in our analysis. The environment surrounding Hong Kong is affected by the reclamation and must be analyzed as a means of health issues and aesthetics of the "fragrant harbor." The following chapter will discuss the methods to which we would accomplish our research.

CHAPTER 3: METHODS

In order to fully understand the Central and Wanchai harbor reclamations, we applied a variety of research strategies based on the relevance that these would have on the identified objectives. The group used a hybrid strategy of acquiring information so that biases and skewed information were minimized. In order to achieve this, we took the information that we obtained through observation, archival research, interviews, and case studies then contrasted them with each other.

3.1 Reclamation, Land Development, Transport Design and Urban Planning

With the intention of determining the complex relationship between the government and the public, we employed several strategies to gather information. One of our methods was to interview key figures in government, Town Planning Board, and LegCo. An example of people we were able to interview was Ian Brownlee who had worked for the planning department of the government in the past. From the Town Planning Board, we were able to interview Winston Chu who gave us insight to various topics including Hong Kong development practices. Apart from the interviews, we also used archival research to gather and understand issues surrounding harbor developments in Hong Kong.

3.2 Proposed Plans by the Government, Professional, and Community Groups

Our methodology for gathering our facts began with a detailed observation of the Central and Wanchai reclamation sites, which gave us a sense of the progress that was being made. This way we had a clear idea of the area that was being developed. Another method that we integrated into our analysis with respect to the Central-Wanchai reclamation was examining the previous developments of harbor reclamation by the Hong Kong Special Administrative Region (HKSAR) government, and the way the Hong Kong government was handling the projects. We took these past cases and observed the similarities and differences that they might have with the proposed development. The importance of analyzing the structure of past projects was that we could assume a strategic structure that the proposed reclamation would have.

We had the opportunity to attend several key lectures that were set up by Ms. Christine Loh and Civic Exchange. These lectures were directly related to our projects being that the speakers had the experience and authority to provide precise data regarding harbor reclamation in Hong Kong, specifically in the Central and Wanchai districts. We obtained the

main ideas from these speakers and if there was a need to further seek their expertise, we scheduled an interview so that we could extract the needed information.

3.2.1 Government Proposal

We conducted a variety of interviews with open ended questions intended for key individuals in order to retrieve critical and substantial data for our investigation. Then we compared and contrasted the justifications made by various key proponents and opponents of the government's proposal.

3.2.2 Environmental Group and NGOs Interests

We interviewed certain environmental groups and organizations to comprehend their perspective on the land and harbor reclamation occurring in Hong Kong. Some specific organizations were the Society for Protection of the Harbor (SHP) and Save Our Shorelines (SOS) because they are some of the many organizations that have been active against the government proposal on harbor reclamation projects. We also tried to understand their goal and specific objectives that they would like to accomplish. We then analyzed their methods on how they confronted the problems, and evaluating the end results that they have encountered.

We also viewed the non-governmental organizations' opinions on the Hong Kong's government's actions on their past land reclamations to see if there were any mutual agreements between the government and NGOs. We did not assume that these non-governmental organizations represented public opinion, because both the government itself and the NGOs are debating over the land reclamation projects in the best interest for the public.

3.3 Environmental and Traffic Congestion Issues

We conducted a case study of traffic congestion problems in the Central and Wanchai districts. To accomplish this, we analyzed local traffic patterns from observing them in person, and through the past government studies. Other sources we analyzed were the pollution monitoring systems to assess the impact on the environment. We also studied whether the proposed bypass and P2 highway system, planned to take place in the Central and Wanchai reclamation area, would alleviate traffic congestion or not. We focused on where the traffic congestion areas were located, what types of vehicles would travel in these areas, what their origins and destinations were, and the number of private vehicles, public

transportation, and commercial vehicles. We used the data collected to compare with other case studies of cities such as Singapore and London.

CHAPTER 4: RESULTS AND ANALYSIS

The majority of our data originated from archival research but it was through site visits and interviews that we were able to derive context and perspective. The Hong Kong Special Administrative Region Government's views and plans were extracted from archival research and Non-Governmental Organization (NGO) views were collected from interviews. From these, we were able to organize our thoughts and make sense of complex plans and competing ideas. The overall reclamation, land development, and transport design provide an expression of Hong Kong's past urban planning priorities. The government and NGO proposals reflect the competing vision of the future of Hong Kong and how the city will be seen along side other cities in the world and be judged by future generations.

4.1 Reclamation, Land Development, Transport Design and Urban Planning

Central Reclamation Phase III (CRIII) and Wanchai Reclamation Phase II (WDII) are still underway with their development. To determine the highly complex relationship between reclamation, land development, transport design and urban planning for the long term, we interviewed various NGOs. Over the years, the government has adopted a historical strategy that affects reclamation today. The government has been reclaiming land layer by layer analogous to making a cake. As time passed, Hong Kong's harbor shrunk drastically, and now the stretch of harbor from Kowloon to Hong Kong Island is about 1 mile long. Due to the multiple land reclamations, the waters have become rough, with boats passing dangerously close to each other while traveling through the harbor. The government is set on reclaiming more land because selling reclaimed land is one of its major sources of revenue. After reclaiming the lands, the revenues from land sales have served to finance the new harbor developments. If harbor reclamation continues, the water between Kowloon and Hong Kong Island might turn the harbor into a river transforming the once "fragrant harbor" into a "fragrant river."

We realize that to change the way Hong Kong raises revenue is a substantial topic beyond the scope of this report. However, we wish to note that using land to raise revenue for more capital works generate incentives for large infrastructure works, which in turn influence the design and development of the city.

NGOs have been encountering a difficult environment when dealing with the government. One of the major NGOs at play for the Central and Wanchai Districts, the Society for Protection of the Harbor (SPH), has been actively protesting against the

government's proposals. Over the course of more than a decade, it has managed to force the government to reduce the extent of reclamation plans. It was through SPH's lobbying that a private member's bill was passed on June 27th 1997 to become the Protection of the Harbor Ordinance. Since its establishment in 1995, other NGOs have also come forth to lobby for better harbor front planning. The NGOs have had substantial media attention and have changed public sentiments about reclamation and harbor front planning. The NGOs have opened the eyes of the people and shown them that their voices can be heard within the government. Persistence has been a key factor. Currently, since the NGOs can no longer stop the on-going reclamation in Central, they are fighting to change the zoning plan that allows for some 9.2 million square feet of new gross floor to be created along the Central waterfront, and the enormous P2 and Central Wanchai Bypass road systems to be built. If the Government maintains all these developments, it will not only ruin the aesthetics of the Central waterfront but also bring in more congestion as well as air and noise pollution.

4.2 Proposed Plans by the Government, Professional, and Community Groups

To determine the various proposed plans by the government, professionals, and community groups, the CRIII and WDII are intended to provide a long term traffic infrastructure for the Central and Wanchai districts. The initial scheme for the Central Reclamation Phase III involved 32 hectares of reclamation. However, after intense opposition by NGOs and green groups advocating for the protection of the Hong Kong harbor, CRIII was reduced to 18 hectares of reclamation. The land was said to specifically provide a traffic infrastructure, including both the Central and Wanchai bypass and P2 highway which are currently in the development plans.

4.2.1 Government Proposal

Central Reclamation Phase III (CRIII) and Wanchai Reclamation Phase II (WDII) both propose a Central and Wanchai underground bypass (CWB) and a ground level P2 highway (6 lanes). In Figure 3 (Background chapter, pg. 8), you can see the government layout of the CWB and the P2 highway, running parallel to the existing Connaught/Harcourt Road. This layout is positioned in order to resolve the forecasts that suggest the traffic congestion in the Central and Wanchai districts will become unsustainable by 2011.

Table 1 displays the results from a traffic forecast of the years 2011 and 2016 for the roads located in Central and Wanchai that would be affected by the CWB. The table compares the volume to capacity ratio (V/C) of the roads and the effect that the CWB will

have on them if built. From these results, the government has estimated that it would take 45 minutes to get through traffic in the Central and Wanchai districts in the year 2011, and predicted that there will be a 30% increase in demand along the corridor from 2004 to 2016. These results show that the CWB will relieve substantially the V/C ratio on the present roads that run through Central and Wanchai.

Location	Without CWB		With CWB	
	2011	2016	2011	2016
Connaught Road Central	1.3 ²	1.3 ²	0.8	0.9
Harcourt Road	1.3 ²	1.3 ²	0.8	0.9
Gloucester Road	1.3 ²	1.3 ²	0.9	0.9
CWB	-	-	0.7	0.7

Table 1: Forecasts of the effect that the CWB will have on traffic in the years 2011 and 2016.

The government has considered alternative traffic management measures which include equal toll pricing for the cross harbor tunnels, electronic road pricing (ERP), restricting loading and unloading times in Central, and other alternatives. However, the government has determined that there is no community consensus for these alternatives, and that the developments of the CWB and P2 highway are the most viable options to solve the traffic problem in Central and Wanchai.

The government proposal for the development of CRIII acts in compliance with the Protection of the Harbor Ordinance by providing a promenade and open spaces for the enjoyment of Hong Kong's citizens. The government wants to provide the city with a vibrant harbor that can be treasured by its people.

From the government proposal overview, in Figure 8, there is a clear representation of the intended promenade and open area meant for leisure activities. The government is also proposing a Ground Scraper and a Festival Market that will become retail centers, tying into the benefit that the development will bring to Hong Kong citizens. The proposal also suggests a development for office buildings, specifically on the Tamar site, that will create the heart of the government branches in Hong Kong.



Figure 8: Government Proposal Overview (HKSARG, 2006)

Figure 9 displays some of the commercial and office developments on CRIII that are marked in red. The areas numbered 2 and 3 would be the proposed Ground Scraper and Festival Market that are intended to become retail centers, and area number 5 will be the location for the government buildings in the Tamar site. The sum of the new commercial and office developments will be approximately 9,244,300 square feet of space.

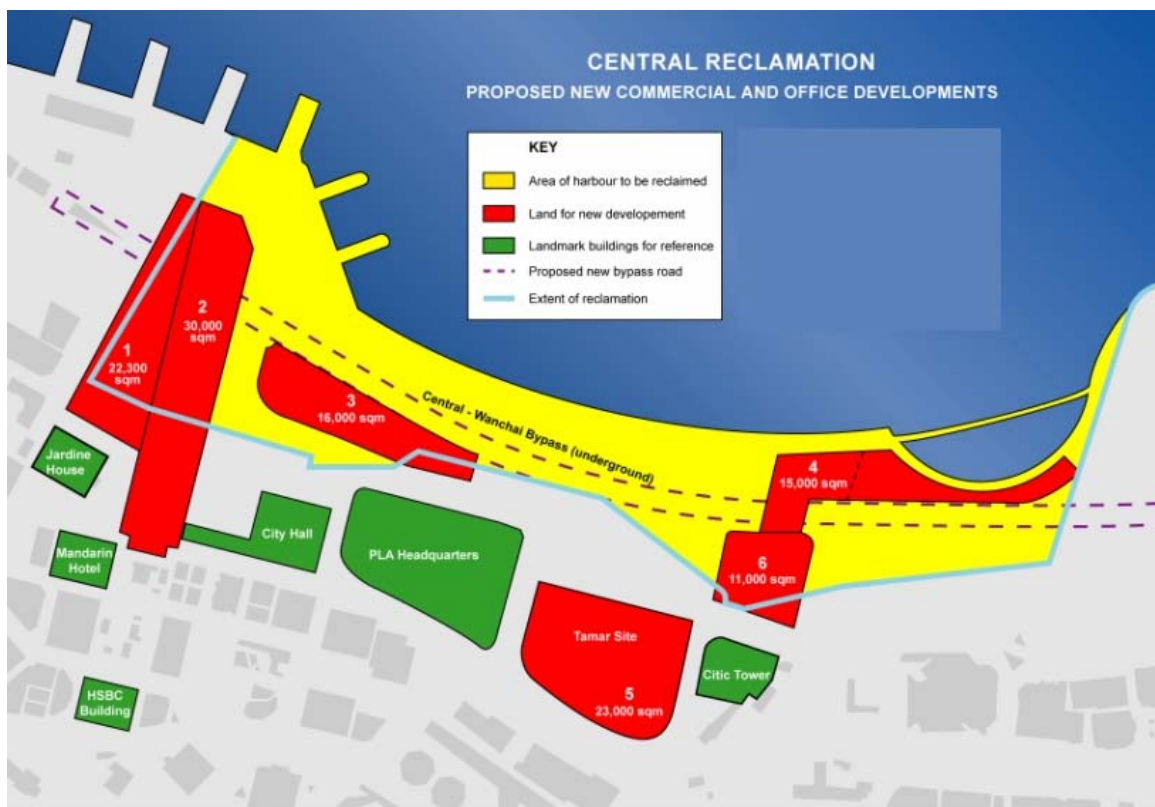


Figure 9: Proposed New Commercial and Office Developments (Society for Protection of the Harbor, 2004)

The WDII, which proposed 28.5 hectares of reclamation, was intended for the key transport infrastructure. WDII at this moment in time is under review by the Town Planning Board because there has been much controversy over the design of the CWB and the extent of reclamation needed. The decision to halt the reclamation of the area was a major win for SPH, which instituted litigation to stop the government in 2003-2004.

4.2.2 Environmental Group and NGOs Interests

Civic Exchange, with the support of other NGOs, has proposed a development plan in Central which will give the reclaimed area back to Hong Kong's citizens. The new proposal provides open green and water areas. This proposal represents an effort to show something totally different from the government's plans and how it can improve the quality of life in the city. Aside from this proposal, the NGOs have also looked into the traffic congestion problem and solutions in the Central-Wanchai districts. The possible solutions for the traffic congestion problem currently are: Electronic Road Pricing (ERP), the P2 Highway, and the Central and Wanchai Bypass.

ERP, P2 Highway, Central and Wanchai Bypass

In our study on the traffic congestion problem in the Central and Wanchai areas from our site visit, we found that there was more of a traffic *volume* problem than a traffic *congestion* problem, as there were numerous vehicles on the road, flowing at a continuous rate. In our observation, we noticed during the peak hours of traffic that the vehicles were moving in a decent pace compared to other business districts around the world. When interviewing Paul Zimmerman, he noted that from his personal experience, "the traffic is fine. Compared with Holland you will be stuck in traffic from 7:00 AM till around 10:30 AM when you go to work. Here we got a traffic jam from around 8:30 AM to 9:15 AM. To me it's not a problem, even then I have no trouble getting to work." (2006). From Figure 10, congestion was only apparent when there was a red traffic light. However, when the light turned green, the traffic continued to move without any sign of long delays.



Figure 10: Peak Hour Traffic in Central (9:00 AM)

By removing all of the developments that the government wants to build, such as the government buildings on the Tamar site, the Ground Scraper, and the Festival Markets, there would be no need for the P2 Highway. The traffic studies that have been used to justify the need for a P2 Highway were done in the 1990s, with the expectation of immense development in the Central area. However, the size of the reclamation area for CRIII was drastically condensed from 32 hectares to 18, and the number of buildings was reduced as well. The NGOs consulted traffic experts and deduced that constructing the Central and Wanchai bypass would efficiently control traffic congestion in that area.

An alternative to the P2 Highway would be to introduce ERP. ERP can work in large cities such as Singapore and London. With the advance in technology, it would be possible to control which type of vehicles would be charged and which would not. An example would be implementing a charge to delivery vehicles if they traveled into the zone during the peak hours. By doing so, it would force them to deliver during non-peak hours. This would be a simple way to control who travels at what time. Among the NGO representatives that we interviewed, there was a consensus that the P2 Highway is a flawed and unnecessary idea. It would create additional noise and air pollution along the harbor front, and it would only serve as a temporary solution for traffic congestion. Another negative attribute of the P2 Highway is its affect on the aesthetics of the harbor. If a park was to be built near the harbor, having a highway running through it would be very unpleasant. An example of this is shown in the following figure.

As can be seen in Figure 11, a park surrounded by highways does not look good. This park is not easily accessible, and the aesthetics of the park are ruined by the amount of noise and air pollution surrounding it.



Figure 11: A Small Park in Wanchai (Civic Exchange, 2006)

Another possible alternative for not implementing the P2 highway may be to extend the Mass Transit Railway (MTR). In May 2000, the government unveiled a new railway development strategy called “Railway Development Strategy 2000” (RDS-2000) (Hong Kong Government, 2005). The RDS-2000 strategy will extend many railways measuring about 300 kilometers in length to such places as the Kowloon Southern Link, West Island Line/South Island Line, and North Hong Kong Island Line. Specifically, the North Hong Kong Island Line would directly affect the traffic flow in the Central and Wanchai districts. This strategy will also contribute to the environmental aspects of traffic congestion. It will help reduce the reliance of road-based transport and reduce vehicle emissions of approximately 600 tons of nitrogen oxides and 160,000 tons of carbon dioxide per year.

Central Park

On January 26, 2006, the Civic Exchange in a press conference released their proposal for the Central Reclamation Phase III area, as well as the Tamar site. This proposal, called “Central Park”, is made possible by Civic Exchange in collaboration with Society for Protection of the Harbor and numerous independent experts. Civic Exchange believes

“Central Park” in the Central Reclamation would be crucial. Their vision for New Central would provide more green areas and quality open public spaces. People could get close to the water and enjoy the harbor for many different activities, other than just shopping. Their “Central Park” proposal offers Hong Kong people an alternative to the government’s plans.

The proposed “Central Park” in Figure 12 will consist mainly of green areas filled with grass and trees. Within the park there will be outdoor activities for the public to use such as a trail for walking and running, a place for swimming and boating, and even a small pier for fishing. In the proposed Tamar site, there will an outdoor performance stage for local groups to use. There will also be space for restaurants, retail stores, and indoor entertainment facilities. However, it will only take up a small percentage of space, and structures in the area will be limited in height. This is not a definite plan that Civic Exchange is proposing, but it is an alternative to the government plans of introducing more buildings and roads.

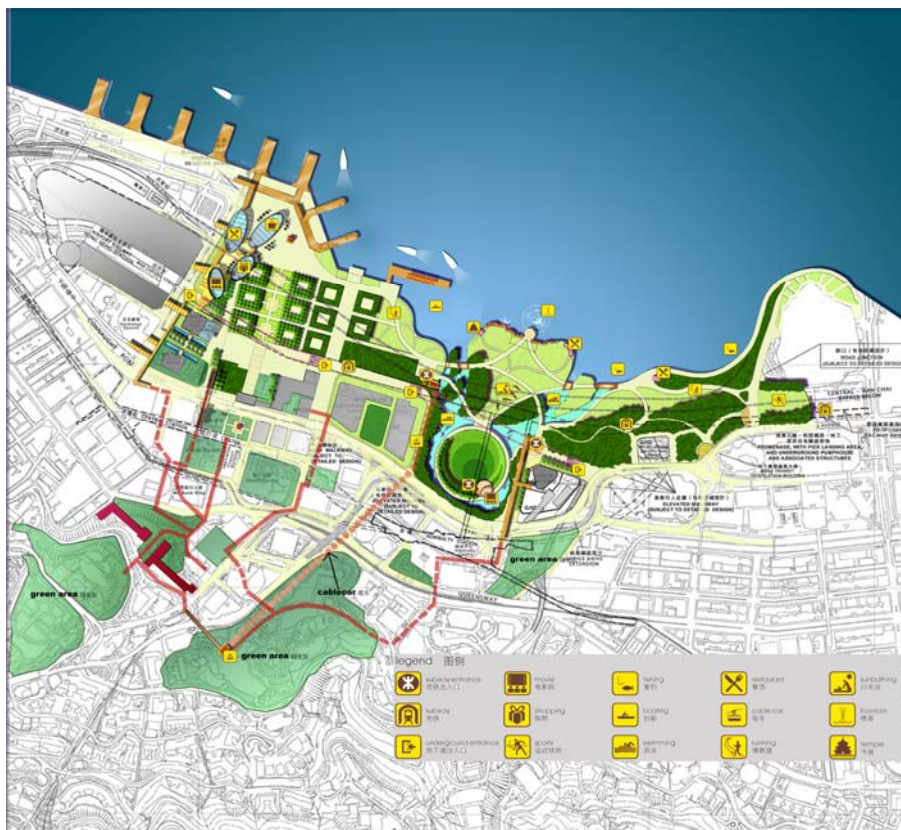


Figure 12: Proposed Central Park (Civic Exchange, 2006)

Swire Plan

The Swire Plan is a creation by Swire Properties Ltd. The Swire Plan was developed in response to the public objections to the initial government proposal. There are three parts to the Swire Plan in both the Central Reclamation Phase III (CRIII) Area and the Tamar Site.

The east side of CRIII will be named the Historic Corridor, while the west side will be the Arts Corridor, and in the middle, as well as the Tamar Site, the area will be called Civic Corridor (Swire Properties Ltd., 1999).



Figure 13: Historic Corridor



Figure 14: The Arts Corridor



Figure 15: Civic Corridor

<ul style="list-style-type: none"> ➤ A series of new and refurbished open spaces will lead from the Legislative Council Building to the new Star Ferry Terminal 	<ul style="list-style-type: none"> ➤ A waterfront promenade will link the Convention Centre and new Queen's Pier with the new crescent park 	<ul style="list-style-type: none"> ➤ A series of below-grade retail concourses will be placed between the Admiralty MTR Station and the civic plaza
<ul style="list-style-type: none"> ➤ A connection will be placed between the Hong Kong / Airport Railway Station and the new Waterfront Boulevard 	<ul style="list-style-type: none"> ➤ A new maritime museum would overlook a quiet harborside basin, serving as a gateway for the pedestrian bridges that cross the maze of roadways 	<ul style="list-style-type: none"> ➤ A major ceremonial pier would be created for special events and visiting naval vessels, anchoring the end of the corridor.
<ul style="list-style-type: none"> ➤ A grand promenade and retail pavilion would overlook the west end of the crescent, providing retail services to both ferry commuters and park visitors 	<ul style="list-style-type: none"> ➤ Two major museum/theatre sites would overlook the east end of the crescent, which would solidify the area's emergence as a centre for the arts 	
<ul style="list-style-type: none"> ➤ A series of development sites would overlook the park and water along the west edge of the corridor, from Harcourt Road to the harbor. 	<ul style="list-style-type: none"> ➤ A relocated city hall, performance, and civic facilities would be built in this area 	

Analysis

There are three major proposals for the use of both the CRIII and the Tamar Site. Although these proposals came from different groups, there are similarities that are apparent in all three (see Table 2). According to a public opinion survey conducted by Hong Kong University, “64% of the respondent replied that Hong Kong is lagging behind in comparison to other major cities like New York, London, Sydney, and Vancouver in regards to having open space and green parks in urban area.” The major similarities in these three proposals are some form of open space near the harbor. The controversies arose in what each proposal felt should be built on the reclaimed land.

	Government	Central Park (Civic Exchange)	Swire Plan (Swire Properties Ltd)
CWB	Yes	Yes	Yes
P2	Yes	No	No
Ground Scraper	Yes	No	No
Festival Market	Yes	No	No
Government Buildings	Yes	No	Yes
Ferry Terminal Addition	Yes	Yes	Yes

Table 2: Proposals Overview

The government proposal, displayed in Figure 16, suggests a promenade. It also suggests some green areas where people can enjoy the harbor, as well as a large portion of concrete walkways similar to those in Avenue of the Stars, which is located on the other side of the harbor in Tsim Sha Tsui. The government also proposes a substantial amount of commercial and office developments that add up to approximately 1,262,000 square feet. These developments will become a source for government revenue and are not site specific to the benefits and needs of the Hong Kong citizens. The substantial amount of development, according to government estimates, will also produce an increase in traffic by 7,623 PCU (Passenger Car Units) per hour, which would add to the already increasing traffic in the Central area. The government could refurbish their existing offices instead of building new ones, in order to prevent the creation of a concrete jungle for the people of Hong Kong.



Figure 16: Government Proposal (HKSARG, 2006)

At the other end of the spectrum is the proposal made by Civic Exchange, seen in Figure 17. As one can see, the proposal wants to use all of CRIII and the Tamar Site as an open green and blue park. The design of the park is meant in its entirety for the people of Hong Kong and their leisure activities. It also incorporates the idea of a living harbor where the general public can enjoy activities such as fishing, boating, and swimming near the harbor. There will be minimum commercial developments that will relate directly to park activities, such as small shops and restaurants. This design will not include any government offices or large commercial space. This proposal, while rejecting the idea of building a P2 Highway, includes the construction of the CWB. According to Civic Exchange, Hong Kong needs to have a piece of heritage that people will be able to cherish in the future.



Figure 17: NGO Central Park Proposal (Civic Exchange, 2006)

The Swire Plan, shown in Figure 18, suggests a moderate proposal that incorporates substantial amounts of both green area and cultural facilities. It has multiple museums and theatres, a promenade for people to enjoy the harbor, and also some commercial space for people to shop. From looking at the Swire Plan, there will not be many outdoor activities for people to do. The proposal did not include the P2 Highway, but it integrated the CWB into its design. Out of the three proposals, the Swire Plan appears to take the middle ground between the government and the NGOs in a best-of-both-worlds scenario.



Figure 18: Swire Plan (Swire Properties Ltd, 2006)

Although the three proposals integrate some similar qualities, we can agree that they could mold the image of Hong Kong in a different way. The government proposal would give the city a sense of an open space with numerous developments and commercial areas, and the other two proposals would tend to focus more on leisurely activities. The Central Park suggested by Civic Exchange would be filled entirely with green and blue areas meant for leisure activities, and the Swire plan would have green areas as well as a cultural site that would help to enhance the city of Hong Kong.

CHAPTER 5: CONCLUSIONS AND RECOMMENDATIONS

Through numerous interviews and a great amount of archival research, our group has been able to accumulate a wealth of information regarding the harbor reclamation of the Central and Wanchai districts. Furthermore, what we have learnt has allowed us to come to some conclusions about both the development of the harbor-front areas, and the traffic congestions issues surrounding Central and Wanchai. From these conclusions, our research and analysis has been able to generate a list of ideas that may be helpful to both main aspects of the harbor reclamation.

In terms of harbor development, the reclamation is well underway and thus the extent of the reclamation must be taken as a given. Nevertheless, from interviews with various NGO representatives, we were able to conclude that, of the three main development proposals, the Central Park project would be an ideal open space for the people. However, due to its revenue structure, developing and maintaining a park would not be profitable for the government. Therefore, the Hong Kong government would have no interest in following through with this proposal, even if it did turn out to be the most beneficial option for the citizens of Hong Kong.

Based on our data, of the three main proposals for the Central and Wanchai developments, the Swire Plan, proposed by Swire Properties, Ltd., may be the most agreeable between the Hong Kong government and NGOs. The proposal includes attributes favorable to both groups, with both green areas and space for government buildings. While it may not be the ideal proposal for either side, the best-of-both-worlds scenario that the Swire Plan presents would be a happy medium for the development of the harbor. Nevertheless, the Swire Plan in fact preceded the Civic Exchange plan and it has already been rejected by the government.

Even if the government decides to go forward with their original proposal, one of the project's aspects could be altered in favor of a more aesthetic direction. Based on our research, the new government buildings planned at the Tamar site would generate a great amount of traffic when completed, making a highway such as the six-lane, ground level P2 a necessity. However, data show that if the current government buildings at Lower Albert Road were refurbished, then a new complex at Tamar would not be necessary. This would not only allow an area for open, possibly green space in CRIII, but it would also help to solve some of the traffic issues predicted in the new development areas.

Through both observations and interviews, we were able to discover that there are currently no serious problems in terms of traffic congestion within the Central and Wanchai districts. Besides the occasional red light or car accident, traffic is always able to run smoothly, with no backup of cars and vehicles that is famous in other big name cities, such as New York or London. However, based on government estimates and predictions, within five to ten years, the districts' main roads, Connaught and Harcourt, would be unsustainable in terms of traffic congestion. It is because of this that the government has proposed both the Central-Wanchai underground bypass (CWB) and the P2 highway as solutions for the impending traffic issues.

Through our research and interviews, we were able to conclude that the Central-Wanchai underground bypass is going to be built, based on increases in traffic volume. Of all the ideas and features being proposed for the developments of CRIII and WDII (Wanchai Reclamation Phase II), the CWB is one plan that both the government and NGOs agree upon. Both groups believe that this highway would not only be beneficial to the traffic congestion in Central and Wanchai, but it would also not affect the aesthetics of the harbor-front, as it would be an underground structure.

The six-lane, ground level P2 highway, however, is considered to be the main area of debate between the NGOs and the government. Though the NGOs believe that the idea would do nothing but ruin the aesthetics of Hong Kong, the government feels that the highway would be a crucial feature to relieve traffic congestion in Central and Wanchai once the harbor reclamation is completed. Through research and analysis, we concluded that even though the highway is not a necessary aspect now, if the government proceeds with their retail and governmental developments in Central and Wanchai, there would have to be some sort of large scale access to these sites, in which the P2 would become essential.

While the government believes that the CWB and the P2 are the only ways to relieve the predicted traffic congestion in Central and Wanchai, our data indicate that there may be other solutions to these issues. One possible idea is known as Electronic Road Pricing, or ERP. ERP would charge a fee to different vehicles at certain times during the day, depending on which areas they drove through. By implementing this system, the level of traffic congestion may decrease substantially, since it would force public, private, and commercial drivers to travel at different times in order to avoid road fees. A way to determine the benefits of this plan would be to create a new traffic analysis including an estimate of how ERP would influence the traffic structure.

Also, according to several NGO representatives, another possible solution to the current traffic issues would be to equalize the toll prices for all three cross harbor tunnels, as opposed to building multimillion dollar highways. One major reason behind traffic congestion in Central and Wanchai is that, to pay less money, rush hour drivers using the cross harbor tunnels choose to take the cheapest of the three, causing an overflow of vehicles under the harbor. An equalization of tolls would spread vehicles out among the three tunnels. Besides this plan, the NGO representatives have also suggested that the government should regulate the number of buses that can go into Central since most of the long-range buses coming from the New Territories were empty by the time they reach Central. We realized that for such plans to materialize, the government would have to re-plan many aspects of its current bus-rail interface.

There was however one issue that needs to be stressed. The government's own declared policy contained in the report "Railway Development Strategy 2000" (RDS-2000) included expanding the Mass Transit Railway (MTR) to include a new North Island Line. If there was to be an extension of the subway, as was envisioned in RDS-2000, then it would make sense for the railway to be put in before the roads. In this aspect, the government may decide not to place infrastructure and utilities in critical areas that would make building the railway more difficult and expensive in the future.

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APPENDIX A: MISSION AND BACKGROUND OF CIVIC EXCHANGE

Civic Exchange is a public policy think-tank that is not for profit, established in September 2000 as a charity in Hong Kong. Its office is located in Room 701, Hoseinee House, 69 Wyndham Street, Central, Hong Kong. In 2003 they had around \$6 million HK in project donations which are their main source of funding. Other sources of income for Civic Exchange are private donations as well as membership fees.

Civic Exchange has an enterprise structure motivated to meet social needs and not financial profits. Civic Exchange is divided up into the projects it leads, however they describe themselves as getting together and discussing relevant ideas and not having a defined structure. The Chief Executive Officer of Civic Exchange is Christine Loh, and the Head of Research is Lisa Hopkinson.

Civic Exchange has two major missions. One is to “promote civic education amongst members of the community and for such purpose to conduct research and publicize the results so as to provide objective and balanced information to the public concerning economic, social and environmental issues” (Civic Exchange, 2005). Its second mission is to “undertake research on development of economic, social and political policies and practices to help shape the breadth and depth of public policy debate and so to provide well-founded and reasoned argument on the issues identified above”(Civic Exchange, 2005).

Civic Exchange has a large number of contributors on a financial as well as intellectual basis. They are supported by several educational institutions that can provide the technology and intellectual capacity needed (i.e. Hong Kong Polytechnic, WPI, Georgia Institute of Technology, etc) for their research. They also count on a number of supporters from Hong Kong companies, environmental groups, and research centers that all add value to Civic Exchange’s resources.

This project addresses both aspects of our sponsor’s mission. On the one hand, it sets on educating and informing the Hong Kong community, as it is in the best interest of the citizens to know what development is being done and how will it affect them. On the other hand, the research being done in this project can help fuel debates and give accurate information about the issues that are being discussed regarding the harbor. These facts can also shape governmental policy strategies towards the area and official decisions on the scene.

There are many non-profit, volunteer organizations dealing with the issues surrounding harbor reclamation in Hong Kong. Organizations other than Civic Exchange,

who are involved, are Society for the Protection of the Harbour Ltd., which is lead by Christine Loh, Friends of the Harbour, Clear the Air, and Save Our Shorelines. From our research we could not discern if there are any relationships, or partnerships between these organizations.

Other Interesting facts we found about our sponsor, especially Christine Loh, was her extended experience in politics and the issues surrounding Harbor reclamation. One of her many achievements was The Protection of the Harbour Bill that was presented to the Legislative Council, and it was passed into law on June 27, 1997.

APPENDIX B: HOW DOES YOUR PROJECT QUALIFY AS AN IQP?

The Interactive Qualifying Project (IQP) is a unique requirement for Worcester Polytechnic Institute (WPI) students, which asks students to analyze how technology and science interacts with society. Through the IQP; the undergraduate students understand how their careers will influence the society they live in, and the importance that science and technology have on our society's development. Most projects are sponsored by external agencies looking to benefit from this kind of study for their specific project, and are usually done as student teams.

These projects give the students hands on experience on real life issues affecting society. The projects do not necessarily relate to the major discipline of the students. However, the students will bring their own experiences and background on social science studies that will help them deliver accurate results.

The analysis of the use of land in the Central-Wanchai Harbor Reclamation tackles an important social issue for the city of Hong Kong and it is a clear example of a good IQP. It provides a study of how these proposed developments by the government will affect the Hong Kong society as well as the surrounding environment. Our goal is to identify the best use of the land in the Victoria Harbor, taking into consideration the needs for the development and the consequences it will bring to the community. We will do this by examining all points of view and ideas, from governmental proposals to the opposition/environmental parties in order to achieve the most effective results.

Science and Technology have provided the necessary tools that the government will utilize to effectively extend the harbor, this is an effective example of an IQP issue because these tools created by science and technology will have a significant impact on the citizens of Hong Kong. The proposed new highway system suggested to take place on the Central-Wanchai waterfront will impact directly the lives of citizens that live or transit through that area; it will also reshape the traditional image of Victoria Harbor that could directly affect public opinion toward the project. The issue of Harbor Reclamation is very alive in Hong Kong and directly concerns its citizens. This project exemplifies how technology has reshaped societies worldwide, and we will try to identify the best alternatives specifically for land use in Central and Wanchai harbor

APPENDIX C: INTERVIEW

This section contains both our interview protocol and a list of the Non-Governmental Organization representatives that we were able to interview. We utilized the interview protocol to ask specific questions to gain a better understanding on our goal. From this, we were able to analyze the interviews' results in order to develop our conclusions and recommendations.

Interviewed NGO representatives and their organizations.

John Bowden – Save Our Shorelines

Stephen Brown – Hong Kong Economist

Ian Brownlee – Masterplan Ltd.

Winston Chu – Society for Protection of the Harbor

Dennis Li – Society for Protection of the Harbor

Santa Raymond – Santa Raymond Consultants

Paul Zimmerman – Designing Hong Kong Harbor District

C.1 Interview Protocol (Non –Governmental Organizations)

Interview by:

Background Information of Interviewee

Date:

Name:

Occupation: Non-Governmental Organization

Education:

Interests: Protecting harbors from the Hong Kong government's excessive reclamations.

General Questions Relating to our IQP

What is the current status of CRIII and WCII?

When is the government planning to begin building on the Tamar site?

In your opinion, why is the government pushing towards commercial development in Central and Wanchai? Are there any political or business sector influences at play?

What are the most notable difficulties that you have had as a Non-Governmental Organization when confronting the Government?

What is the Swayer plan for Central and Wanchai? Is this plan the one most accepted by the public? Is the government utilizing this proposal?

The NGO's such as Civic Exchange and SOS have managed to already reduce the amount of reclamation substantially. What is your next goal or plan of action?

What can be done so that the P2 highway does not go forward?

Do you think the government should implement some sort of ERP within Central and Wanchai?

In your opinion, which is the best proposed plan for Central and Wanchai?