



The Effect of the Green Deck on the Local Real Estate Market

(Final Report)

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Summary – The Effect of the Green Deck on the Local Real Estate Market

This report is divided into two stages. In the first stage, we have identified the existing problems facing the Hung Hom district, such as traffic congestion, overcrowding, pollution, poor linkage to the neighboring area, and the lack of open space and greenery, and then discussed how the construction of the proposed Green Deck would benefit various parties, including stakeholders (i.e. existing [and potential] owners of flats in areas surrounding the green deck, as well as owners of offices in the same areas), public in vicinity, and visitors alike.

In the second stage, a cost-and-benefit analysis has been conducted to evaluate the latent direct and indirect benefits the Green Deck could bring forth to the future rental income of buildings either constructed on the Green Deck or surrounding it. It is found that, subjected to different conditions and assumptions, the proposed Green Deck project could generate direct benefits (i.e. additional rental income for the five proposed buildings constructed on the Green Deck) between HKD 208.8 million and HKD 1,022 million, and indirect benefits (i.e. additional rental income for the three existing buildings in the surrounding area) from HKD 143.4 million and HKD 714.3 million. However, as the construction cost of the whole Green Deck project, in accordance with the consultant, ranges from HKD 4,825 million to HKD 5,025 million, the project might yield direct benefits (in a 25-year period) amounting to 4.2-21.2% of the total anticipated construction cost of the Green Deck, in addition to a fraction of the indirect benefits payable to the government in a much later date by means of rates.

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Chapter 1

1.1 Background

In view of the lack of greenery and open space in Hung Hom District and the weak connectivity over the existing Hung Hom Cross Harbour Tunnel infrastructure, the Hong Kong Polytechnic University (PolyU) would like to propose the construction of a green deck linking PolyU, Hung Hom MTR station, and Tsim Sha Tsui East promenade together. It is estimated that the deck will act as an urban green lung with better environment and connectivity. This is the 1st stage report to advocate the benefit of the PolyU proposed Green Deck.

1.2 Problems

There are several problems facing the Hung Hom District, namely traffic congestion, overcrowding, pollution, poor linkage to the neighboring area, and the lack of open space and greenery. Details of these issues will be shown in the following sections.

1.2.1 Traffic Congestion

Among all the harbour tunnels in Hong Kong, the Cross Harbour Tunnel, despite being the oldest, is the most used. Therefore, traffic congestions are common in the pathways near the tunnel, especially from Kowloon to Hong Kong Island. This situation is even worse during peak hours. Sometimes, the congestion continues until midnight before the weekends or public holidays (Figure 1.1).



Figure 1.1: Congestion problem near Cross Harbour Tunnel in the daytime and night time

1.2.2 Overcrowding

Another problem is related to overcrowding at the footbridges connecting PolyU, Hung Hom MTR Station, and Tsim Sha Tsui East. Those rather narrow footbridges contain a high pedestrian flow volume from/to these three areas (in addition to the bus stations underneath these bridges) on a daily basis (see Figure 1.2). The situation becomes even worse in peak hours due to 1) the gathering of people queuing for buses; and 2) and the distribution of free newspapers, further decelerating the flow of pedestrians.



Figure 1.2: Overcrowding problems at the footbridges during daytime and night time

1.2.3 Pollution

Noise and air pollutions are found in Hung Hom bridges. The former mainly comes from the vehicles underneath the bridges while the latter can be traced from different sources. The main sources of air pollution affecting the pedestrians are 1) the second-hand smoke from smokers (Figure 1.3); and 2) the smoke emitted from vehicles. Both affect not only the pedestrians (especially those queuing for buses) but also the environment. The air quality is further compromised due to poor ventilations



Figure 1.3: Pollution caused by second-hand smoke

in the Hung Hom Station.

1.2.4 Poor linkage to the neighboring area

As the Hung Hom MTR Station is the intersection of major MTR railway lines (the East Rail Line and the West Rail Line) as well as the destination of the Guangdong Line, the Shanghai Line, and the Beijing Line, it is rather common for Mainland Chinese visitors (who travel to Hong Kong by railway) to begin their journey in Hung Hom. However, it takes them at least 10 minutes to walk to the nearest tourist spots in Tsim Sha Tsui East (i.e. from the concourse of Hung Hom train Station [Figure 4; Right] through subways and stairs [Figure 1.4; Left] to the footbridges connecting the Station to the University/Tsim Sha Tsui East).

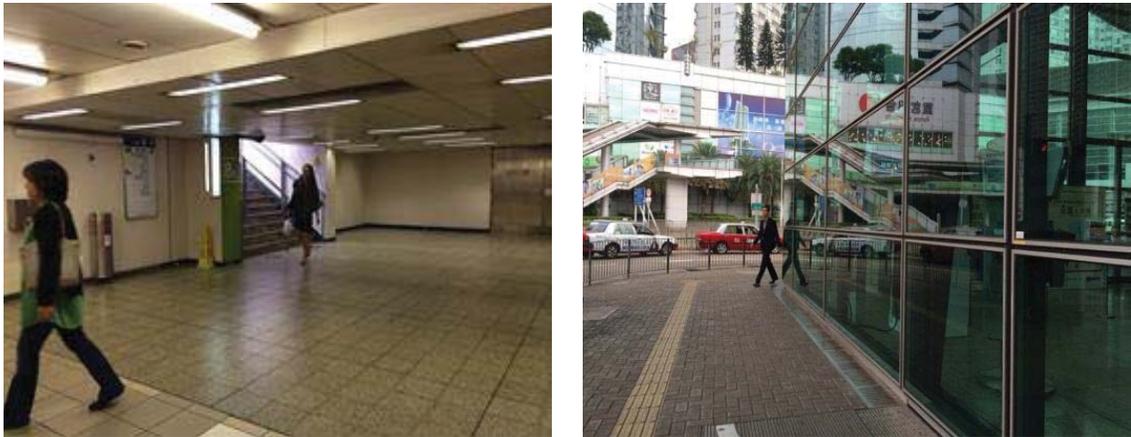


Figure 1.4: (Left) Subways and stairs passing to the train station/(Right) Train Station

Similar situations can be found in the linkage between Hung Hom Station and the Tsim Sha Tsui Promenade. There are two major routes, either through two separate flyovers (Figure 1.5) or through Science Museum Road and Mody Road (Figure 1.6). It takes about 20 minutes to reach the Tsim Sha Tsui Promenade from Hung Hom Station (and vice versa) via the first route, and even more so via the second.



Figure 1.5: First route from Hong Kong Polytechnic University/Hung Hom MTR Station to Tsim Sha Tsui East Promenade
 (Source of map: <http://www1.map.gov.hk/gih3/view/index.jsp>)



Figure 1.6: (Left) Roadside in Science Museum Road, view from the pavement/(Right) Mody Road, view from the bridge

1.2.5 Lack of open space and greenery

According to the Outline Zoning Plan S/K9/24, the permitted open space occupies only a small portion over the nearby area. Only one park can be found at the Hong Tat Path. In addition, it is required to pass through a bridge for one to reach the park. Owing to the inconvenience, people may not be willing to visit and use the park.

Besides, the lack of green features is also a problem in the district (Figure 1.7). The situation can be attributed to narrow roads design and insufficient plantations on highways and flyovers.



Figure 1.7: Insufficient greenery near Hung Hom Station

1.3 The Area

In order to address the aforementioned issues in the district, a green deck is suggested to be built. According to the PolyU consultant, there will be a high-level leisure platform which serves as a public park amenities deck. A number of sports and leisure facilities will be provided to enhance better quality of life for neighboring precincts

such as Lookout Deck/Outdoor Amphitheatres. Details can be referred to Figure 1.8 below.

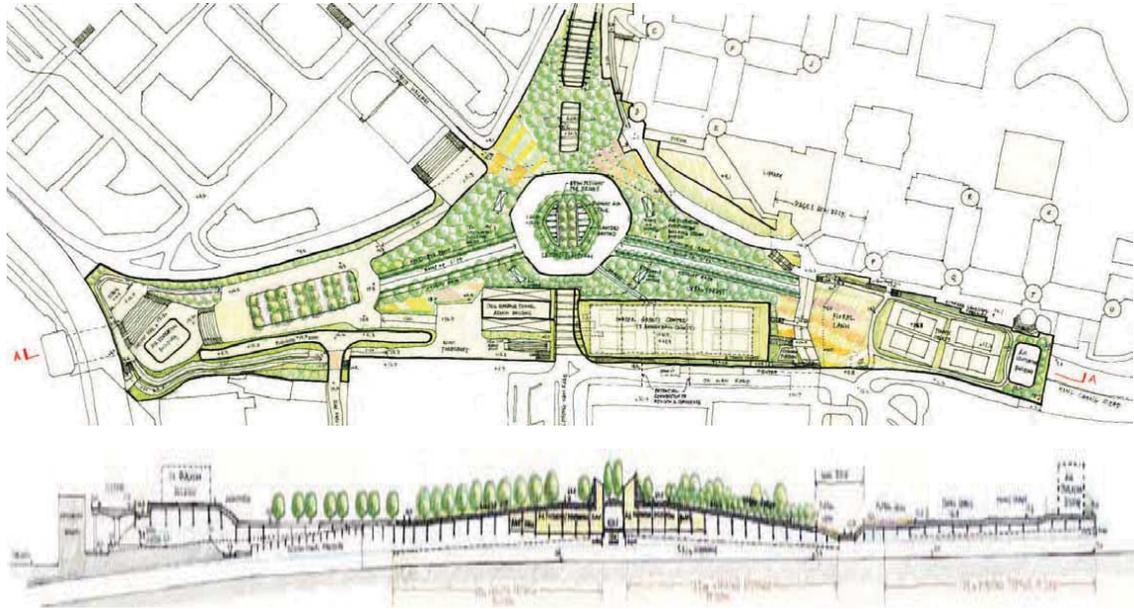


Figure 1.8: Green deck design sketches (Source: PolyU consultant sketch 02)

1.4 Zoning

Figures 1.9 & 1.10 illustrate the zoning of the area proposed for the construction of the green deck under the Outline Zoning Plan S/K9/24(OZP), and the (other) specified uses of this area, respectively.

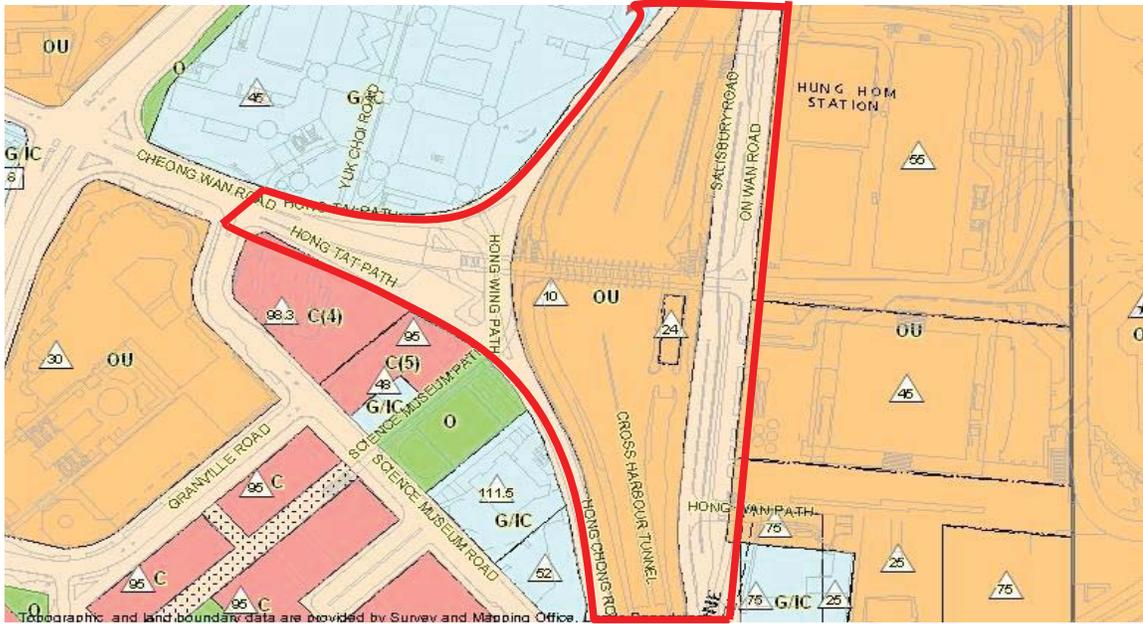


Figure 1.9: (Above) OZP S/K9/24 with red line indicating the proposed green deck area (Source: http://www.ozp.tpb.gov.hk/mv_default.aspx) (Below) Corresponding area shown in map (Source: <https://maps.google.com.hk/>)

OTHER SPECIFIED USES

Column 1 Uses always permitted	Column 2 Uses that may be permitted with or without conditions on application to the Town Planning Board
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For "Multi-storey Carpark to Include Garages for Maintenance and Servicing of Motor Vehicles and Petrol Filling Station" only

Petrol Filling Station
Public Vehicle Park
(excluding container vehicle)
Vehicle Repair Workshop

Government Use
Mass Transit Railway Vent Shaft and/or
Other Structure above Ground Level other than Entrances
Office
Shop and Services
Utility Installation not Ancillary to the Specified Use

Planning Intention

This zone is intended to provide/reserve land for the development of a multi-storey carpark to include garages for maintenance and servicing of motor vehicles and petrol filling station serving the needs of local residents as well as the general public.

Remarks

- (1) No new development, or addition, alteration and/or modification to or redevelopment of an existing building shall result in a total development and/or redevelopment in excessive of a maximum plot ratio of 12.0 or the plot ratio of the existing building, whichever is the greater.
- (2) No new development, or addition, alteration and/or modification to or redevelopment of an existing building shall result in a total development and/or redevelopment in excess of the maximum building height, in terms of number of storeys, as stipulated on the Plan or the height of the existing building, whichever is the greater.
- (3) In determining the relevant maximum number of storeys for the purposes of paragraph (2) above, any basement floor(s) may be disregarded.

(Please see next page)

OTHER SPECIFIED USES (Cont'd)

Remarks (Cont'd)

- (4) Where the permitted plot ratio as defined in Building (Planning) Regulations is permitted to be exceeded in circumstances as set out in Regulation 22(1) or (2) of the said Regulations, the plot ratio for the building on land to which paragraph (1) applies may be increased by the additional plot ratio by which the permitted plot ratio is permitted to be exceeded under and in accordance with the said Regulation 22(1) or (2), notwithstanding that the relevant maximum plot ratio specified in paragraph (1) above may thereby be exceeded.
- (5) Based on the individual merits of a development or redevelopment proposal, minor relaxation of the building height restriction mentioned in paragraph (2) above may be considered by the Town Planning Board on application under section 16 of the Town Planning Ordinance.

(Please see next page)

Figure 1.10: Schedule of Notes of OZP S/K9/24

(Source: http://www.ozp.tpb.gov.hk/mv_default.aspx)

1.5 Scope of Work

A number of research studies will be conducted for this project, as required by the Chairman of the Task Force. To facilitate this research, the investigation is divided into two stages: “advocacy” and “substantiation”.

1.5.1 Stage 1- “Advocacy”

The first stage aims to solicit support from two groups of people, namely the stakeholders and the public in vicinity. A report, which serves as a proposal to be reviewed by the MTRC and by different Government Bureaus, will be completed detailing the benefits of the proposed Green Deck project.

1.5.2 Stage 2 - “Substantiation”

The second stage aims to cover the findings from the detailed research, in which a cost-and-benefit analysis will be conducted to substantiate the feasibility of the Green Deck Project.

1.6 Advantages of the Green Deck

After an investigation of the architect design, it is found that the green deck can bring about different benefits in different areas. To have a thorough investigation, some international success cases have been studied. In this part, the general benefits will be described first, followed by a presentation of international cases for reference and by a discussion of the specific benefits of this project for different parties.

1.6.1 General Benefits

Generally, green decks and green roofs alike have numerous social, economic, and environmental benefits and can contribute positively to issues surrounding climate change, biodiversity, and declining green space in urban areas. Other possible benefits include:

- Lessening Urban Heat Island Effect
- Increasing biodiversity and green features
- Reducing sound transfer
- Increasing amenity, livable space

- Enhancing life style varieties
- Better landscape views
- Enhancing urban sustainability

Even though there are many successful cases of green roofs around the world, little has been done for the investigation of the effects of green decks, despite the similarities between them. This Green Deck proposed by PolyU will hence serve as a good case for investigation.

1.6.2 International Experience

Three successful cases have been examined, including 1) the Galveston Island Historic Pleasure Pier, 2) the High Line Flyover, 3) the Queensway High Line-Style Park; and 4) the Hangzhou Waterfront Implementation Scheme. Details of those cases will be provided in the following sections.

1.6.2.1 The Galveston Island Historic Pleasure Pier

The Galveston Island Historic Pleasure Pier (Figure 1.11) is an amusement park located in Galveston Island, Texas (the United States). Before the construction of the Historic Pleasure Pier, Galveston Island was an isolated island out of Texas without much commercial activities. Its construction attracts more people to this island. Therefore, related commercial activities can be stimulated, such as hotel services and shopping stalls, hence generating more revenue for the island.



Figure 1.11 Galveston Island Historic Pleasure Pier

(Source: <http://www.galveston.com/galvestonishistoricpleasurepier/>)

1.6.2.2 The Falcone Flyover

The Falcone Flyover (Figure 1.12) is situated at Manhattan, New York (the United States). It is a sky garden with lots of resting space and greenery. As Manhattan is one of the most densely-populated areas in New York, space is limited for residents' relaxation. As stated in the *New York Times* (2011), it “will take people eight feet up above the High Line from 25th Street to 26th Street, moving them through a canopy of magnolia trees and between two tall warehouse buildings, with glimpses of a hidden smokestack and passageways to the west.” Besides, this project has been recommended by Friends of the High Line.



Figure 1.12 The Falcone Flyover

(Source:

<http://www.thehighline.org/blog/2013/05/10/photo-of-the-week-falcone-flyover>)

1.6.2.3 The Queensway High Line-Style Park

The Queensway High Line-Style Park, located in Queensway (the United States), is a project similar to that in New York (i.e. the Falcone Flyover). By building the park, the land can be utilized more efficiently by redevelopment as the planned area is an abandoned rail line. As a result, more space can be made available to the public.



Figure 1.13 The Queensway High Line-Style Park

(Source:

<http://inhabitat.com/nyc/queensway-high-line-style-park-gets-even-closer-to-reality-with-1-million-in-funding/>)

1.6.2.4 The Hangzhou Waterfront Implementation Scheme

In Mainland China, the Hangzhou Waterfront Implementation Scheme is one of the more successful examples that covers the highways by a greenery deck and enables pedestrians to flow freely from developed areas to the lake front without any traffic obstructions. In the scheme, it not only integrates the space but also makes it **much more attractive and picturesque** by adding landscape designs with cultural effects, which serves as a new attraction for the tourists.







Figure 1.14: Hangzhou waterfront implementation scheme
(Source: blog.sina.com.cn/s/blog_673c8b9e0101a4pr.html)

1.6.3 Specific Benefits

The green deck is found to be beneficial for various parties, including stakeholders, public in vicinity, and visitors in different aspects. Details regarding the benefits of this project for each group will be shown in the following sections.

1.6.3.1 For Stakeholders

The stakeholders in this project include existing (and potential) owners of flats in areas surrounding the green deck, as well as owners of offices in the same areas. Hui et. al. (2012) did an excellent summary of the impact/benefit of landscape views on surrounding properties. The following presents an abstract of the literature review from it.

It has been shown in the literature that various landscape factors are significant in explaining property prices. For instance, it has been shown in many studies on the Hong Kong property market that residents show obvious interest in seaview (i.e. the

Victoria Harbour; see Choy et al., 2007; Hui, et al., 2007; Tse, 2002); and reclamation of the harbour does not cause a significant drop in property value in repeat sales (Yiu et al., 2008).

For the influence of nearby green belt area with an area of at least 20,000 m², while Hui et al. (2007) do not find evidence supporting such an influence, Choy et al. (2007) conclude that condominiums with garden view tend to be sold at higher prices. Similar findings have been reported by Jim and Chen (2010), as residents prefer the proximity to neighbourhood parks to harbour view.

The impact of a condominium's proximity to roads and avenues on property prices is somewhat complicated. A condominium located near the main avenue not only means better accessibility but also indicates noise disturbance and worsened air quality. Lulttik (2000) finds that the noise pollution effect might induce lower housing price, even though Jim and Chen (2006) do not find this effect to be significant. However, the findings in Jim and Chen (2010) indicate the residents' aversion towards traffic noise and air pollution in Hong Kong when an apartment is near the streets. Furthermore, an apartment located in a region with better air conditions would have a much higher price than others (Hui et al., 2007).

By making many of those landscape factors available to the stakeholders through the construction of the green deck, it is reasonable to say that this project will be beneficial to them.

1.6.3.2 For Public in Vicinity

Having examined the design submitted by architects, the benefits of the construction of the Green Deck for the public in vicinity have been evaluated and summarized in the table below.

Features	Before	After	Benefits
Viewing Platform/Food and Beverage	<ul style="list-style-type: none"> ➤ Lack of Victoria Harbour views ➤ Insufficient availability of food and beverage stores near the harbour 	<ul style="list-style-type: none"> ➤ Enhanced Victoria Harbour views ➤ Higher availability of food and beverage stores for the public at the seafront promenade 	<ul style="list-style-type: none"> ➤ Attract more people to the seafront ➤ More choices in food and beverage for the public
Green Edge	<ul style="list-style-type: none"> ➤ Few greenery in the district 	<ul style="list-style-type: none"> ➤ More greenery ➤ Helps improve air quality 	<ul style="list-style-type: none"> ➤ Improve air quality with the increase in greenery
Apartment	<ul style="list-style-type: none"> ➤ Lack of landscape views for flats near the Tsim Sha Tsui seafront 	<ul style="list-style-type: none"> ➤ Improved landscape views 	<ul style="list-style-type: none"> ➤ Better landscape views and better investment potential for flats in the area
Hotel	<ul style="list-style-type: none"> ➤ Insufficient waterfront views 	<ul style="list-style-type: none"> ➤ Better waterfront views 	<ul style="list-style-type: none"> ➤ Attract more tourists to stay in hotels located in Tsim Sha Tsui East
Willow Edge	<ul style="list-style-type: none"> ➤ Lack of stroll area 	<ul style="list-style-type: none"> ➤ Stroll area available 	<ul style="list-style-type: none"> ➤ Provide a shady and comfortable resting and stroll place
Reflection Pool	<ul style="list-style-type: none"> ➤ Lack of comfortable resting space 	<ul style="list-style-type: none"> ➤ Unique feature ➤ Availability of comfortable 	<ul style="list-style-type: none"> ➤ Could become a tourist spot ➤ Provide a comfortable resting

		resting place	space
Arts Gallery	➤ Insufficient facilities about art	➤ Provides space for art exhibitions	➤ Provides platform for artists ➤ Arouse public interests in art
The Forest Green	➤ Lack of greenery	➤ More greenery ➤ More open space	➤ Enhanced air quality
Amphitheatre	➤ Insufficient space for performance arts in Tsim Sha Tsui	➤ More space provided for performance arts	➤ Provides a platform for performance artists on the streets ➤ Attracts local people and tourists alike
Arena	➤ Insufficient facilities for smaller-scale performances	➤ More space available for these performances	➤ Offers platform for artists ➤ Attracts tourists
Sculpture Garden	➤ Lack of open space for placing enormous sculptures	➤ Space available for placing large sculptures	➤ Arouse public interests in art ➤ Attract more people to the district
The Lantern	➤ Lack of Chinese tourists spots in the district	➤ Feature specifically designed for tourists ➤ Not commonly seen in other areas of Hong Kong	➤ Potential in becoming a tourist spots having Chinese element ➤ Attracts more people to Tsim Sha Tsui
Sports Centre	➤ Not enough facilities for sporting purposes	➤ More space available for sporting purposes	➤ Residents can use more public sports facilities
Kiosk	➤ Lack of small-scale snack stalls in the district	➤ Availability of small-scale snack stalls	➤ Attracts tourists if kiosk selling unique snacks

			➤ More alternatives for consumers
Kidsland	➤ Insufficient open space for children in the district, especially near the harbour front	➤ More open space available	➤ Facilitates outdoor activities for children
Lawn	➤ Insufficient green open space	➤ More green open space	➤ More open space for residents resting in their leisure time with their family
Floral Garden	➤ Insufficient greenery in the district	➤ Area designed for plantation of various kinds of flowers	➤ Provides a livelier environment
The Boulevard	➤ Insufficient long and straight streets planted with trees	➤ long and straight walkway planted with trees	➤ More comfortable walking experience
City Wadi	➤ Lack of open space ➤ Lack of art features outdoors	➤ More open space provided	➤ Provides platform for artists for displaying their works ➤ Attracts visitors
Pavilion	➤ Lack of resting space in the district	➤ Covered resting space available	➤ Provides resting space for local people and visitors alike

Table 1.1: Benefits of features based on the architect design

1.6.3.3 For Visitors

A brief note on the Importance of the tourist industry in Hong Kong

The tourism industry in Hong Kong comprises of a number of sectors such as visitor attractions, accommodation, catering, transportation, travel intermediaries, retailing, and tourism-related public sectors. Over the past 20 to 30 years, Hong Kong has transformed to a serviced-based economy with tourism as one of the major contributors to its nominal GDP. Table 1.2 below indicates how the tourism industry plays its role in the four pillars industries in Hong Kong.

Industry	2000		2009		Annual growth rate
	(HK\$bn)	Share (%)	(HK\$bn)	Share (%)	
Financial services	150.8	11.9	235.6	15.2	5.1
Tourism	30.9	2.4	50.9	3.3	5.7
Trading & logistics	302.3	23.8	373.4	24.1	2.4
Professional services	137	10.8	202.8	13.1	4.5
Four pillars	621	48.9	862.6	55.6	3.7
Nominal GDP	1,270.5	100.0	1,550.9	100.0	2.2

Table 1.2: Value added of the four pillar industries in Hong Kong

(Source: Fan and Yim, 2011)

Moreover, the tourism industry has provided over 78,200 job opportunities in Hong Kong (Fan & Yim, 2011) and is still in its upward development as a result of government policies such as the Individual Visit Scheme (IVS), launched in 2003, which allows mainland Chinese residents of selected cities to visit Hong Kong on an individual basis. It is estimated that mainland Chinese residents has accounted for about 63% of total arrivals in the year of 2010. Such a trend is expected to grow as the citizens of more Chinese cities have been gradually included in IVS.

However, the development of new tourist attractions in Hong Kong has been slowed down due to limited space. Only a few new tourist attractions have been added into the existing list by the Hong Kong Tourism Board (Table 1.3). This situation not only

affects the sustainable growth of the tourism industry in Hong Kong but also reduces the competitive advantages Hong Kong has over other Asian countries.

Year	Tourist Attraction
2000	Chi Lin Nunnery
2004	A Symphony of Lights multimedia show
2005	Wisdom Path
	Hong Kong Disneyland
2006	Ngong Ping 360
	The Dr Sun Yat-sen Museum
	The Hong Kong Wetland Park
2009	Hong Kong Global Geopark of China

Table 1.3: Development of tourist attractions in Hong Kong, 2000 – 2009
(Source: Hong Kong Tourism Board, 2010; 2011)

How the tourism industry can benefit from the proposed green deck?

The Tourism industry is characterized by a high level of dynamism. With the expectation that the existing tourism attractions in Tsim Sha Tsui may reach its limits of development in the coming years, the society needs to plan ahead for new destinations to ensure the attainment of enjoyment and relaxation for the tourists.

With current research in the spatial pattern of new tourist attractions, new developments should be in close proximity to the original sites so as to reap the benefits of agglomeration effects. In counting the existing tourism assets located in Tsim Sha Tsui district, it is found that most of them are in their original forms for many years without renovations or maintenance. New changes are thus necessary to integrate and combine them to meet the needs of the tourism industry.

According to the Hong Kong Tourist Association, three of the top 10 tourist attractions in Hong Kong (Table 1.4) are in Tsim Sha Tsui district and they are all located along the Victoria Harbour. They are the Avenue of Stars, the Tsim Sha Tsui Promenade, and the Clock Tower. However, due to them being developed in different

periods of time, these 3 attractions are not integrated together under a main theme, thus losing a strategic position to realize the maximum development potential of the harbourfront in Hong Kong.

Name	District
Avenue of Stars	Tsim Sha Tsui
The Peak	Peak
Ocean Park Hong Kong	Aberdeen
Hong Kong Disneyland	Lantau Island
Ladies' Market	Mongkok
Temple Street Night Market	Yaumatei
Hong Kong Convention and Exhibition Centre (and Golden Bauhinia Square)	Wanchai
Tsim Sha Tsui Promenade	Tsim Sha Tsui
Sik Sik Yuen Wong Tai Sin Temple	Wong Tai Sin
Clock Tower	Tsim Sha Tsui

Table 1.4: Top Ten Attractions in Hong Kong (Source: Hong Kong Tourism Board, 2013)

The proposed green deck that covers the main trunk of road works of the cross harbor tunnel and connects the main campus of the Hong Kong Polytechnic University and the Hung Hom MTR Station together (with a possible extension to the Victoria Harbor front) serves as a good opportunity to make an evolutionary change to the district. The proposed design not only addresses the existing pedestrian congestion issues at peak hours but also creates new sources of open space for the general public. In the meantime, it fulfills the vision of the government to enhance the Victoria Harbour and its harbourfront areas, in order to become an attractive, vibrant, accessible, and sustainable world-class asset: a harbor for the people and a harbour of vitality by increasing its connectivity to the inner part of the city.

Under the proposed design, pedestrian access and open space offer pedestrians, visitors, and tourists alike the opportunity to engage in a variety of activities. It provides an ideal space for all the stakeholders with trees and greenery/lawn areas;

open space for public activities; access to MTR station; seating areas and also some kiosks to serve the public. Activities like outdoor carnivals or cultural/art group performances (e.g. street performances, mini concerts, magic shows); outdoor exhibitions of visual arts; Christmas and new year count-down activities; weekend market and harbor watching could also be held in this green deck. More importantly, it does not create any additional burden on the transportation infrastructure in the area.

In view of what constitutes an ideal tourism precinct as summarized by Griffin, *et al.* (2008), it can be said with confidence that the proposed green deck can fulfill the following purposes:

- Providing places for tourists to begin the process of exploring the city.
- Providing places that assist tourists to focus their experience on the city area and to economize their time and effort.
- Providing respite or refuge from the everyday life of the city.
- Putting the tourist into a state of mind that reflects their desires as a tourist (at leisure) within a setting (the city) that is not normally associated with being a tourist.
- Enabling the visitor to connect with the people of the city in a setting where the needs and mind-states of both tourists and residents are compatible.
- Enabling the tourist to develop a better understanding of the city, its people and its history.
- Providing opportunities for convivial encounters, with other tourists, with locals and aspects of local life.
- Enabling the tourist to experience a more distinctive sense of place than is afforded by an “internationalized” city center.
- Providing an environment where the tourist has more freedom to wander and explore.

1.7 Conclusion

The proposed green deck is a unique opportunity for Hong Kong to create new tourism assets and green space for residents relaxation. With the success of different international cases, it is believed that the construction of the deck can achieve its aim. The implementation not only addresses the issues of the existing footbridges in the peak hour but also connects the open space in the harbor front together in order to proffer a new look to the Victoria Harbour.

This proposal specifically deals with the first stage, which is to solicit support from two groups of people, namely the stakeholders and the public in vicinity. Afterwards, the project will proceed with the second stage, in which a cost-benefit analysis for the project will be conducted in order to assess the benefits derived from this project.

1.8 References

Choy L.H.T., S.W.K. Mak and W.K.O. Ho (2007), Modeling Hong Kong Real Estate Prices, *Journal of Housing and the Built Environment* 22(4): 359-368.

Fan, I., & Yim, J. (2011). Hong Kong tourism industry. Hong Kong Trade Development Council. Retrieved August 16, 2011, from http://www.hktcdc.com/resources/MI/Article/ef/2011/04/346536/1303354802473_hsb10420en.pdf

Griffin, T., Hayllar, B., & Edwards, D. (2008). Places and people: A precinct typology. In B. Hayllar, T. Griffin, & D. Edwards (Eds.), *City spaces – tourist places: Urban tourism precincts* (pp.39-61). Oxford, UK: Butterworth-Heinemann.

Hong Kong Tourism Board. (2010). Hong Kong Tourism Board annual report 2009/2010. Hong Kong: Hong Kong Tourism Board.

Hong Kong Tourism Board. (2013). Discover Hong Kong - Official travel guide from the Hong Kong Tourism Board. Retrieved September 5, 2011, from <http://www.discoverhongkong.com/eng/>

Hong Kong Tourism Board. (2011). A statistical review of Hong Kong tourism 2010. Hong Kong: Hong Kong Tourism Board.

Hui E.C.M., C.K. Chau, L. Pun and M.Y. Law (2007), Measuring the Neighboring and Environmental Effects on Residential Property Value: Using Spatial Weighting Matrix, *Building and Environment* 42: 2333-2343.

Hui E.C.M., Zhong J.W. and Yu K.H (2012), The impact of landscape views and storey levels on property prices, *Landscape and Urban Planning* 105:86-93.

Luttik J. (2000), The Value of Trees, Water and Open Space as Reflected by House Prices in The Netherlands, *Landscape and Urban Planning* 48: 161–167.

Jim C.Y. and W.Y. Chen (2006), Impacts of Urban Environmental Elements on Residential Housing Prices in Guangzhou (China), *Landscape and Urban Planning* 78: 422-434.

Jim C.Y. and W.Y. Chen (2010), External effects of neighbourhood parks and landscape elements on high-rise residential value, *Land Use Policy* 27: 662-670.

New York Times. (2011), More Room to Roam. Retrieved November 27, 2013, from http://www.nytimes.com/slideshow/2011/05/29/nyregion/20110529_HIGHLIGHT-6.html?_r=0

Tse R.Y.C. (2002), Estimating Neighbourhood Effects in House Prices: Towards a New Hedonic Model Approach, *Urban Studies*, 39 (7): 1165-1180.

Yiu C.Y., K.W. Chau and S.K. Wong (2008), An Empirical Study of Sea View Value

by Repeat Sales Method, SSRN Working Paper.

Chapter 2

2.1 Introduction

There are numerous problems currently facing the Hung Hom District. In light of these problems, the Hong Kong Polytechnic University (PolyU) has proposed the construction of a Green Deck Development located at the over the existing Toll Plaza and the Tunnel Portal of Hung Hom Cross Harbour Tunnel. The first chapter of this report, which constitutes Stage 1 of this investigation (i.e., “Advocacy”), has 1) identified these problems; and 2) discussed the potential advantages of this development project, in terms of general benefits and of specific benefits (for stakeholders, for public in vicinity, as well as for visitors). In this chapter, the findings for Stage 2 of the investigation (i.e., “Substantiation”), in which a cost-benefit analysis of both the direct and indirect benefits incurred by this project is to be conducted¹, are to be presented and discussed.

Prior to the analysis, however, what has been proposed by PolyU to be constructed on this Green Deck development and how it changes the existing land use planning arrangements are to be discussed.

2.2 The Proposed Green Deck Development

According to PolyU’s proposal, the Green Deck, in which a District Park as well as other features (see following paragraphs), is located over the area between the Hung Hom Cross Harbour Tunnel and its Toll Plaza, the Hung Hom MTR Station Podium (West), and the campus of the Hong Kong Polytechnic University. It is divided into two parts – the Main Deck Area and the Extended Deck Area. While the former, with a proposed area of 43,000m², is located right above the current Cross Harbour Tunnel Toll Plaza, the latter (approximately 60,000m² in size) further extends to the area above Hung Hom MTR station and the promenade. The Green Deck development, as a whole, is perceived to create an area of 103,000m² of primarily green and open space (amounting to about 70% of the total Deck area), aiming to proffer various

¹ It should be noted that this evaluation exercise does not take into consideration 1) the possible environmental impact and 2) the possible impact on tourism as a result of the Green Deck, both of which are not within the scope of this study.

benefits to stakeholders, public in vicinity, and visitors alike. A preliminary master plan of the Green Deck is illustrated in Figure 2.1, and its preliminary sketches in Figures 2.2, 2.3, and 2.4 below.



Figure 2.1: Landscape Master Plan of Proposed Green Deck Development



Figure 2.2: Preliminary sketches of the Proposed Green Deck Development



Figure 2.3: Preliminary sketches of the Proposed Green Deck Development



Figure 2.4: Preliminary sketches of the Proposed Green Deck Development

The proposed Main Deck area is further divided into several zones for specific purposes, such as cultural, sports, and leisure (Figure 2.5).



Figure 2.5: Zoning Plan of Proposed Green Deck

For the two cultural zones (areas in yellow), PolyU proposes that

- An Art Gallery;
- A Willow Edge and Reflection Pool;
- An Amphitheatre or Arena;
- A unique structure called the Lantern; and
- A Sculptural Garden (where the Lantern is to be located)

be constructed (Figures 2.6-2.8).



Figure 2.6: Preliminary sketches of the Proposed Art Gallery and Surrounding Area



Figure 2.7: Preliminary sketches of the Proposed Amphitheatre / Arena



Figure 2.8: Preliminary sketches of the Proposed Lantern and Sculptural Garden

For the sports zone (area in red), a sports complex and a soccer pitch are proposed to be built.

And for the leisure zone (area in green), the following features are proposed to be constructed (Figures 2.9 & 2.10):

- A botanic garden;
- An area specifically for kids;
- A lawn;
- An area for Forest Green & Kiosk, as well as
- A Seafront Promenade.



Figure 2.9: Preliminary sketches of the Proposed Botanic Garden



Figure 2.10: Preliminary sketches of the Proposed Lawn

In addition to these zones, there will also be two separate harbour vista points (area in purple) in which a viewing deck (where food & beverages will be served) and a Pavilion will be developed (Figures 2.11 & 2.12).

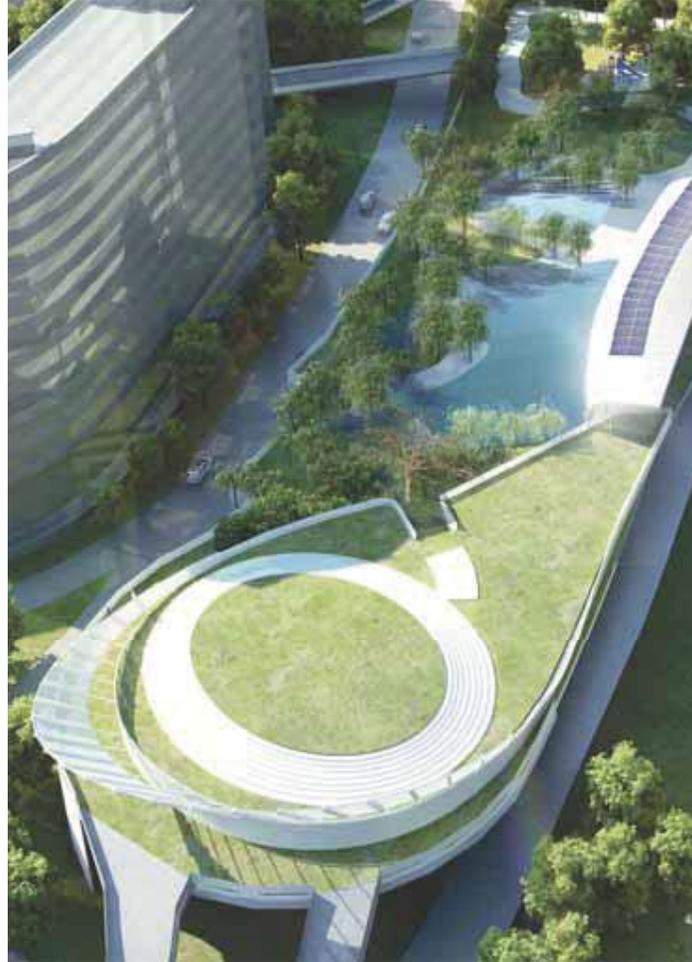


Figure 2.11: Preliminary sketches of the Proposed Viewing Deck (Seafront Promenade)



Figure 2.12: Preliminary sketches of the Proposed Pavilion

Meanwhile, in the Extended Deck Area, five buildings, including one office building, two hotels, and two residential apartment buildings, are proposed to be constructed. The proposed GFA for the office building is 48,000m² (with 20 storeys) and that for one of the hotels is 19,000m² (with 17 storeys). However, currently no information is available as to the proposed GFAs (and the number of storeys) of the second hotel and the two residential apartment buildings. This, to a certain extent, could affect the evaluation in the cost-benefit analysis, as shown later in this chapter. Therefore, several assumptions would be made during the evaluation stage (see later sections).

2.3 The Outline Zoning Plan (OZP) Situation

In view of the large-scale construction of the Green Deck itself and of the buildings, structures, and facilities on the Green Deck, this section aims to describe the changes required within the land use legislations in order to render this project happen.

The area in which the Green Deck development is proposed to be constructed (i.e. the Hung Hom Cross Harbour Tunnel and its Toll Plaza) is included in the Tsim Sha Tsui Outline Zoning Plan (S/K1/28) of Kowloon Planning Area No. 1. In the Tsim Sha Tsui OZP, the area in question is currently approved for “Other Specified Uses”, in that it is primarily allocated for the Cross Harbour Tunnel Toll Plaza. It is stated in the approved OZP for this area that “no new development, or addition, alteration and/or modification to or redevelopment of an existing building shall result in a total development and/or redevelopment in excess of the maximum building heights in terms of metres above Principal Datum as stipulated on the Plan, or the height of the existing building, whichever is the greater”; and that “Based on the individual merits of a development or redevelopment proposal, minor relaxation of the building height restriction stated (in the previous statement) may be considered by the Town Planning Board (TPB) on application under section 16 of the Town Planning Ordinance.” Additionally, it is also stipulated in the OZP that, besides uses specified on the Plan, the only other uses which may be permitted, with or without conditions on application to the TPB are “Government use” and “MTR Vent Shaft and/or Other Structure above Ground Level other than Entrances”.

Taking these stipulations into account, numerous modifications of the existing S/K1/28 are required in order for the proposed construction of the Green Deck Development to materialize. With reference to the existing Tsim Sha Tsui OZP, for the proposed Main Deck Area, the current land use (“Other Specified Uses”) has to be changed to “Open Space” before the Deck itself (and the proposed structures and facilities on it) could be built.

And for the Extended Deck Area in which the five buildings are located, the current land use (“Other Specified Uses”) has to be modified to either

- “Commercial” or
- “Residential”

use for these proposed buildings to be constructed.

2.4 The Impact of Relevant Landscape Views on Property Price

The proposed Green Deck aims to proffer a sizeable park, in which various types of trees are to be planted and different kinds of landscape structures (along with other facilities such as an art gallery, a football pitch, and a sports centre) erected. However, the supposed benefits of the Green Deck to the neighboring properties are not simply limited to those constructed on it. Instead, by building a Green Deck above the Tunnel Portal of Hung Hom Cross Harbour Tunnel, the existing adverse impact induced by street (and/or road) view on the price of surrounding buildings is subsequently neutralized.

In the light of this, the following sections first discuss the relevant literature with regard to the impact of 1) neighborhood parks; 2) trees; 3) different landscape types; and 4) street (or road) view on property price. In addition to a review of the literature, a case study in which the relationship between a neighborhood park (i.e. Kowloon Park) and the price of surrounding residential properties is to be presented.

2.4.1 Review of Literature

2.4.1.1 Neighborhood Parks and Green Areas

There have been numerous studies across the globe which focus on the effect of neighborhood parks on the price of surrounding properties. Among U.S. studies, an investigation by More et al. (1998) in Worcester, Massachusetts shows that a house that is located 20 feet from a park, on average, would be USD 2,675 higher than a similar house 200 feet from the same park. They also find that such positive impact on property price due to the presence of the park is all but evaporated for houses 2000 feet away from it (or more). Another study by Lutzenhiser and Netusil (2001) in Portland, Oregon reports similar findings, as well-landscaped urban parks would yield a premium amounting to 1.8% of property price for houses within 1,500 feet. While the above two research studies focus on prices of properties within a specific range in distance (from neighborhood parks), Anderson and West (2006) explore how the distance between a house and the nearest neighborhood park would influence housing

price, and conclude that a house would be 0.0035% more expensive if it is closer to the nearest neighborhood park by 1%.

In addition to these studies, there have been a few other western studies which investigate the effect of green areas on property price, with results generally similar to those presented above. For example, Tyrvaïnen (1997) finds that prices of apartments in North Carelia, Finland would be 42FIM per square meter less than similar apartments that are 100m closer to wooded recreation areas. Morancho's (2003) investigation in this regard in Castellón, Spain reports that every 100m further away from a green area would cause the price of a residential property to fall by about 300,000 pesetas (Euro 1800 or about 1% of the ceiling price). It is also found by McLeod (1984) that a higher-than-average garden quality would induce a premium amounting to 3% of property price for houses in Perth, Australia.

Besides the western literature, many researchers in Asia have conducted similar studies within the Asian property markets, especially those in Hong Kong and in Mainland China. For the former, it is found by Jim and Chen (2010) that the price of a flat which is near neighborhood parks could be 16.88% higher (i.e. 14.93% due to availability and 1.95% due to view) than that of a similar flat without the benefits of those parks. Another study by Hui et al. (2012) finds a comparatively smaller positive impact of neighborhood parks on property price, at 5.94%. And for the latter, Jim and Chen (2007) finds that a garden vista generates a premium as many as 23.1% of housing price in Guangzhou. From a different perspective, Kong et al. (2007) report a positive relationship between the percentage of green space area within a 300m radius of a house and property price, as each percentage point of green space creates a premium amounting to 2.1% of the per square meter housing price. Their findings also show that a house which is 1% closer to parks would be 1.6% more costly (per square meter) than another house with similar characteristics.

2.4.1.2 Trees

As for the impact of trees on prices of surrounding properties, Anderson and Cordell (1985) find that tree cover leads to higher property price by 3-5%. Meanwhile, Sander et al. (2010) provide a different perspective in their investigation in this issue, as they report that an increase in tree cover, by 10%, within 100m (250m) increases average housing price by 0.48% (0.29%). There have been other studies which consider the relationship between trees and housing price under different conditions. For instance,

it is found by Dombrow et al. (2000) that the presence of mature trees on a parcel increases the price of nearby houses by 2%; while Morales et al. (1983) report that trees on wooded lots generate an additional 10-17% in home sale prices.

2.4.1.3 Landscape Types

Regarding the impact of different landscape types on property prices, a study on the housing market in Quebec City, Canada concludes that landscaped curbs would yield a premium of about 4.4% of property value. Another study by Luttik (2000) on the housing market in the Randstad, the Netherlands reports that attractive landscape types yield a premium about 5-12% higher than less attractive ones. The literature in the Oceania (i.e. New Zealand) concerning this issue produces rather similar results. According to Bourassa et al. (2004), particularly attractive improvements in areas surrounding a property induces a premium amounting to 27% of its value, while poor-quality landscaping could reduce property price by 51%.

2.4.1.4 Roads/Streets

Lastly, concerning the effect of road (or street) views on property price, previous studies have mostly illustrated that such an effect is negative. For instance, Jim and Chen (2009) report that street view reduces the price of a property by 3.7%. In another study conducted by the same authors (Jim and Chen, 2010), however, shows that street view reduces property price by 1.39%. Hui et al. (2012) investigate the impact of two types of street views, namely Main Avenue and street, and find that the former leads to a 6.5% decrease in sale price while the latter suppresses property price by 3%. In addition to the Hong Kong-related studies, an investigation conducted by Lake et al. (1998) also concludes that there is a negative impact on property price of about 2.5% as a result of road visibility.

Within the context of this study, the benefits incurred by the construction of the Green Deck are the net difference between the impact on property price due to the availability of Green Deck View and that as a result of proximity to roads/streets. With reference to previous Asian studies on the effect of landscape views on property prices, it is found that the former ranges between 5.94% and 16.88%, with an average of 11.41%; whereas the latter ranges from -6.5% (or -3.7%) to -1.39%, with an average of -3.86% (or -2.7%). As a result, the net differential between the two items, should the Green Deck be constructed, would be either:

- 7.33% (Low-end situation);
- 14.11% (Average situation 1);
- 15.27% (Average situation 2);
- 20.58% (High-end situation 1); or
- 22.38% (High-end situation 2)

All five situations are to be included into the evaluation of these five buildings.

This section has presented the relevant literature regarding the impact of various landscape views on property prices. Of all these attributes, the effects of neighborhood parks and road/street, in the Asian literature, would be the focuses of the cost-benefit analysis in latter section. However, as these studies, while valuable, primarily investigate the issue in question within a larger context (for instance, Hong Kong as a whole), a more region-specific study is thus needed to complement (and validate) what has been found in the literature. The following section presents our findings of a case study in which the effects of a neighborhood park (i.e. Kowloon Park) with characteristics similar to those proposed for the Green Deck on the transaction prices of two nearby residential buildings is evaluated.

2.5 Case Study – The Impact of Kowloon Park View on Prices of Nearby Residential Buildings

Evaluating the benefits of the Green Deck on prices of surrounding buildings is difficult because there is no similar case in Hong Kong. However, it can be assumed that a neighborhood park with characteristics similar to those proposed for the Green Deck can be a good reference in the evaluation of the possible benefits incurred due to the Green Deck. Therefore, a case study on how Kowloon Park, which 1) has some of the characteristics proposed for the Green Deck for instance the Sport Centre and 2) is close to the proposed location of the Green Deck, affects the transaction price of flats in two nearby residential buildings (i.e. Victoria Towers and the Masterpiece; see Figure 2.13) has been conducted.



Figure 2.13: Locations of the Victoria Towers (on the top left hand corner) and the Masterpiece (on the bottom right hand corner)

2.5.1 Data Source

In this evaluation, data of flats in Victoria Towers and in the Masterpiece transacted between 16/9/2011-31/3/2014 is deployed (i.e. 46 transactions in total). The transaction data, including information such as transaction price and a flat's orientation, was gathered from Midland Realty and Centerline Property Agency.

As the focus of this evaluation is on the effect of a neighborhood park view on property price, a comparative method is used to compare the transaction price of flats with such a view with that of other flats within the same building which do not have access to similar view. However, prior to this comparative analysis, the transaction price data, including 25 units (Victoria Towers) and 21 units (The Masterpiece), is to be adjusted with references to the following housing attributes: location, orientation, sea view, floor level, building age, time, and size of housing unit. These attributes are to be further described in the following sections.

Location: Since residential units in the same development are being compared with one another, the locational effect can therefore be minimized.

Orientation: Flats facing either south or east are usually more preferred by buyers while those facing west is not as preferable since it also means the unit has to suffer from thermal discomfort caused by sunset. The degree of adjustment with respect to a flat's orientation, is based upon industry norm, which is shown in Figure 2.14 below (For the orientations of the two buildings under study, see Figures 2.15 & 2.16).

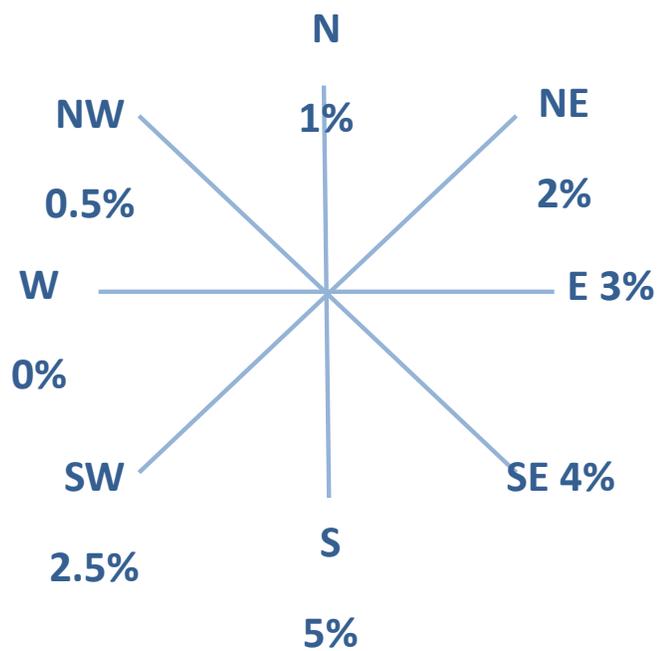


Figure 2.14: Degree of adjustment with respect to orientation



Figure 2.15: Orientation of units in The Masterpiece

Note: Units in location J can enjoy Kowloon Park view, while those in locations C, D, E, F, G, H, and J can enjoy sea view



Figure 2.16: Orientation of units in The Victoria Towers

Notes: 1) Units in locations A, B, E, and F of Tower 1, in locations C, D, E, and F of Tower 2, and in locations A and B of Tower 3 can enjoy sea view; 2) Units in locations B, C, D, and E of Tower 1, in locations A, B, and G of Tower 2, and in locations C, D, and E of Tower 3 can enjoy both park view and sea view

Sea view: Since buyers usually are willing to pay more for residential units facing the sea, adjustments will be made on these units accordingly. The degree of adjustment in this attribute, grounded on industry norm, is 5% for residential units which have sea view over those which do not.

Floor level: As higher floors also indicate better air quality and better view(s), adjustments will be made on units having higher floor level. The degree of adjustment in this regard, as an industry norm, is at 0.25% per floor level. For the Victoria Towers and the Masterpiece, their respective floor levels are 20 and 30.

Building age: Higher building age usually reflects more deteriorated building conditions. In the light of this, downward adjustments, at 0.5% per annum, will be made on the housing units under study. For the two residential buildings under study,

the ages of the Victoria Towers and the Masterpiece are 11 and 7, respectively.

Time adjustments: As residential flats included in this valuation were not being transacted at the same time, time adjustments are required to ensure that the transaction prices used in this exercise share the same base price. The degree of adjustment in this regard is hence based upon the property price index at the time this valuation is conducted and that at the time when a particular housing unit is transacted.

Size: Usually, larger flats are accompanied by better layout and relatively luxurious designs, resulting in higher per unit price. Therefore, adjustments will be made accordingly, with the degree of adjustment at 3% for Class C, D, or E units (i.e. 70m² or larger).

2.5.2 Findings

After using method of comparable to identify value of residential units with and without green view, it is found that residential units with Kowloon Park view have a slightly higher selling price than those without green view. For instance, of transacted units within the Victoria Towers, the price of those with Kowloon Park view were being sold, on average, at HKD 17,312 per square feet, about 5.5% higher than that of those without it (i.e. HKD 16,412 per square feet). And of transacted housing units in the Masterpiece, the average sale price of those with Kowloon Park view is HKD 19,523 per square feet, approximately 3% higher than others without the same view (i.e. HKD 18,955 per square feet). The findings, in general, are in line with that in Hui et al. (2012) concerning the premium generated by neighborhood parks on property values².

² The figures, if factoring in the negative impact on property price neutralized as a result of the Green Deck, are similar to the low-end estimates in the Asian studies as presented.

2.6 The Potential Benefits of Green Deck

It is expected that, should the Green Deck be constructed as planned, both direct and indirect benefits could be incurred for buildings on the Green Deck itself and for buildings in the surrounding areas. The following sections would present an evaluation of these benefits.

2.6.1 The Potential Direct Benefits of Green Deck

In this section, the five proposed buildings in the extended Green Deck are to be evaluated, in order to gauge the potential benefits brought about by the construction of the Green Deck (i.e. availability of/access to a neighborhood park and green areas). Prior to the assessments, however, several assumptions are to be made due to the limited information currently available with regard to these buildings.

These assumptions are presented as follows:

- The premium of landscape view(s) (in percentage) is identical for the office building, the two hotels, and the two residential apartment buildings
- The value(s) of these buildings are represented by the net present value (NPV) of their respective rental income within 25 years
- All proposed land-use changes (refer to previous section) are approved by the Town Planning Board
- The proposed office building only provides Class A office space
- Only Classes A, B, and C flats would be proffered in the two residential apartment buildings

Having established the assumptions, two scenarios are to be depicted to see how the construction of the Green Deck would benefit the value of the (proposed) adjacent buildings. The following conditions would be identical for these two scenarios:

- The monthly rental value of the office building in the first period is based upon that of Class A offices in Tsim Sha Tsui (HKD 491 per square metre) in January 2014
- The daily rental value (i.e. rates) of the two hotels in the first period are based on that of the Hotel ICON (HKD 60 per square metre), which is facing the area in which the Green Deck is proposed to be built
- The monthly rental value of the two residential apartment buildings in the first

period are grounded on that of Classes A, B, and C residential units in Kowloon (HKD 300 per square metre) in January 2014

- The percentage of GFA rentable for the office building is 70%
- The percentage of GFA rentable for the two hotels is 60%
- The percentage of GFA rentable for the two residential apartment buildings is 75%
- The amount of rentable GFA benefitted from the construction of the Green Deck, on average, is 25%

2.6.1.1 Scenario 1

The following sections present the results of the evaluation, separately, of the proposed office building, hotels, and residential apartment buildings.

The Proposed Office Building

For the office building, its rental growth rate is assumed to be at 6% per annum, which is based on the average rental growth of Class A office in TST between 1999 and 2013. Also, *Hong Kong Property Review 2013* reports that the vacancy rate of Class A offices in Tsim Sha Tsui was 2.5%. Therefore, the occupancy rate of the building is set accordingly at 97.5%.

The proposed GFA of the office building, according to the proposal, would be 48,000m², thus the eventual rentable GFA amounts to 33,600m²; and the discount rate is assumed to be the same as the best lending rate at present (i.e. 5% per annum).

Without the Green Deck, the net present value of rental income generated by the office building in a 25-year period is HKD 5.161 billion. Taking it into account, the resultant NPVs of the office buildings are as follows:

- HKD 5.256 billion (Low-end situation)
- HKD 5.344 billion (Average situation 1)
- HKD 5.358 billion (Average situation 2)
- HKD 5.427 billion (High-end situation 1)
- HKD 5.450 billion (High-end situation 2)

To put it differently, the latent benefits incurred by the presence of the Green Deck on

the proposed office building ranges from **HKD 94.6 million** to **HKD 288.8 million**.

The Proposed Hotels

For the two proposed hotels, due to the lack of information concerning the proposed GFA for one of them, it is assumed that, to allow for easier calculations, both hotels would have the exact same size (i.e. 19,000m² in GFA), thus their rentable GFAs would be identical. In addition, the rates of these two hotels are assumed to rise at 5% per annum, and their respective occupancy rates are 80%.

The estimated NPVs of the two proposed hotels' rental income over 25 years, without the presence of the Green Deck, are HKD 4.690 billion³ each. With the Green Deck, however, the estimated NPVs become:

- HKD 4.776 billion (Low-end situation)
- HKD 4.856 billion (Average situation 1)
- HKD 4.869 billion (Average situation 2)
- HKD 4.932 billion (High-end situation 1)
- HKD 4.953 billion (High-end situation 2)

In other words, the latent benefits incurred by the presence of the Green Deck on each proposed hotel would be between **HKD 85.9 million** and **HKD 262.4 million**.

The Proposed Residential Apartment Buildings

Lastly, for the two proposed residential apartment buildings, as a result of a lack of information in the proposal about their respective GFAs, they are assumed to have a maximum allowable GFA of 30,000m². In addition, their rental values are postulated to increase by 4.7% per year, based on the average yearly rental growth in Kowloon from 1999 to 2013)

Within a 25-year period, the NPV of rental income generated by each of the two residential apartment buildings, without the presence of the Green Deck, is HKD 1.864 billion. Should the Green Deck be constructed, the NPV of rental income for

³ It should be noted that, due to promotional packages provided by the hotels themselves or by travel agencies, the actual figure would much likely be lower than this estimate.

each building becomes:

- HKD 1.898 billion (Low-end situation)
- HKD 1.930 billion (Average situation 1)
- HKD 1.935 billion (Average situation 2)
- HKD 1.960 billion (High-end situation 1)
- HKD 1.968 billion (High-end situation 2)

The net difference between the NPV of each residential building then ranges from **HKD 34.2 million to HKD 104.3 million**

In summary, the total latent benefits by means of rental income generated by all five proposed buildings would be between **HKD 334.8 million to HKD 1,022 million**.

2.6.1.2 Scenario 2

In December 2013, then-Chairman of the Federal Reserve, Ben Bernanke, announced that the monetary programme under which bonds were bought with newly-printed money (commonly known as Quantitative Easing) was to be scaled down gradually⁴. This announcement, since then, has been interpreted by many as a sign of an improving U.S. economy, and U.S. interest rates are expected to rise in the near future. This has important implications to Hong Kong, as the Hong Kong Dollar, under the Linked Exchange Rate System, is being pegged to the U.S. Dollar at 1USD=7.8HKD. Under this system, Hong Kong is not able to control/adjust its own money supply and interest rate in response to local and global market changes, while maintaining the pegged exchange rate. In other words, if interest rates of the U.S. increase as expected, so would Hong Kong's interest rates, which would in turn influence property price/rental levels, and the subsequent NPVs of the proposed buildings.

This scenario aims to depict such a situation and evaluate how changes in interest rate (used as a proxy of the discount rate in the analysis), as well as those in rental levels, affect the additional value incurred to the five proposed buildings as a result of the construction of the Green Deck.

⁴ <http://www.federalreserve.gov/newsevents/press/monetary/20131218a.htm>

The Proposed Office Building

For the office building, a number of assumptions are revised in response to the situation presented in the previous paragraphs. In essence, the suggested growth rates in Scenario 1 are to be reduced by 50%. In this scenario, the rental growth rate for office space is assumed to be 3% per annum, as opposed to 6% per annum; and the occupancy rate is to be downward adjusted from 97.5% (i.e. at 2.5% vacancy rate) to 95% (that is, at 5% vacancy rate).

Without the Green Deck, the net present value of rental income generated by the office building in a 25-year period is HKD 3.211 billion. Taking it into account, the resultant NPVs of the office buildings are as follows:

- HKD 3.270 billion (Low-end situation)
- HKD 3.324 billion (Average situation 1)
- HKD 3.333 billion (Average situation 2)
- HKD 3.376 billion (High-end situation 1)
- HKD 3.390 billion (High-end situation 2)

To put it differently, the latent benefits incurred by the presence of the Green Deck on the proposed office building ranges from **HKD 58.8 million** to **HKD 179.6 million**.

The Proposed Hotels

Likewise, two adjustments are being made in the evaluation of the NPVs of the proposed hotels' rental income, namely, 1) the growth in hotel rates is assumed to be 2.5% per annum, rather than 5% per annum in Scenario 1; and 2) the occupancy rate is to be lowered from 80% (Scenario 1) to 70%.

The estimated NPVs of the two proposed hotels' rental income over 25 years, without the presence of the Green Deck, are HKD 2.797 billion each. With the Green Deck, however, the estimated NPVs become:

- HKD 2.849 billion (Low-end situation)
- HKD 2.896 billion (Average situation 1)
- HKD 2.904 billion (Average situation 2)
- HKD 2.941 billion (High-end situation 1)

- HKD 2.954 billion (High-end situation 2)

In other words, the latent benefits incurred by the presence of the Green Deck on each proposed hotel would be between **HKD 51.2 million** and **HKD 156.5 million**.

The Proposed Residential Apartment Buildings

As for the two proposed residential apartment buildings, in this scenario, their rental growth rates are to be cut by 50% to 2.35% per annum, while other factors remain constant.

After such adjustment, the NPV of rental income generated by each of the two residential apartment buildings, without the presence of the Green Deck, is HKD 1.295 billion. Should the Green Deck be constructed, the NPV of rental income for each building becomes:

- HKD 1.319 billion (Low-end situation)
- HKD 1.341 billion (Average situation 1)
- HKD 1.344 billion (Average situation 2)
- HKD 1.362 billion (High-end situation 1)
- HKD 1.367 billion (High-end situation 2)

The net difference between the NPV of each residential building then ranges from **HKD 23.7 million to HKD 72.5 million**

In summary, the total latent benefits by means of rental income generated by all five proposed buildings in this scenario would be between **HKD 208.8 million to HKD 637.6 million**.

2.6.2 The Potential Indirect Benefits of Green Deck

In addition to the five proposed buildings constructed on the Green Deck itself, it is also expected that the Green Deck would have a certain degree of effects on the values of areas/buildings surrounding it. In light of this, the following section, akin to

the section above, aims to provide an estimation of the potential benefits incurred by the construction of the Green Deck on these surrounding buildings. Nonetheless, unlike the five proposed buildings which result in direct benefits for the government, the benefits generated as a result of the construction of the Green Deck are indirect. To put it differently, as these buildings already exist and are under the ownership of property developers, these developers, instead of the government, would benefit directly as a result of the availability of an unblocked Green Deck view. The government, however, is only able to reap a tiny fraction of these benefits via rates in the future.

There are a number of buildings which would directly benefit from the construction of the Green Deck, by means of an unblocked view to the Deck. These buildings include:

- The Main Campus of the Hong Kong Polytechnic University
- Hotel ICON (36,000 m²)
- Harbour Plaza Metropolis (42,857m²);
- New East Ocean Centre (Approx. 30,174.4m²);
- Concordia Plaza (Approx. 76,426m²); and

Of those areas/buildings, three buildings are the focuses of this study, namely, Harbour Plaza Metropolis, New East Ocean Centre, and Concordia Plaza. The exclusion of the Hong Kong Polytechnic University's Main Campus is self-evident, as it is an academic institution which is, on paper, not for commercial purpose (and rent-seeking). Similar argument can also be applied to Hotel ICON, which is a research/academic-based facility under the ownership of the Hong Kong Polytechnic University itself.

Similar to the estimations for the proposed buildings located on the Green Deck, two scenarios are to be depicted to explore the latent benefits on the value of the three surrounding buildings which might enjoy an unblocked Green Deck view.

2.6.2.1 Scenario 1

The following sections present the results of the evaluation, separately, of New East Ocean Centre & Concordia Plaza, and of the Harbour Plaza Metropolis. The assumptions used for the estimations are essentially the same as Scenario 1 for the

proposed buildings, with two exceptions: 1) The amount of rentable GFA benefited from the construction of the Green Deck, on average, is 20% rather than 25%; 2) The daily rental value of Harbour Plaza Metropolis in the first period is HKD 40 per square metre.

New East Ocean Centre & Concordia Plaza

Similar to the proposed office buildings in the previous section, the rental growth rate of these two office buildings is assumed to be at 6% per annum. Also, the occupancy rate of the two buildings is set at 97.5%.

The GFA of New East Ocean Centre & Concordia Plaza, together, is approximately 100,600m², thus the assumed rentable GFA amounts to 74,620m²; and the discount rate is assumed to be the same as the best lending rate at present (i.e. 5% per annum). However, it should be noted that, a discount rate of 10% (on the premium incurred due to Green Deck view) is introduced in this evaluation, due to the slight disadvantage with respect to proximity to the Green Deck in comparison with the proposed office buildings located on the Green Deck itself.

Without the Green Deck, the net present value of rental income generated by the two office buildings in a 25-year period is HKD 11.462 billion. Taking it into account, the resultant NPVs of them are as follows:

- HKD 11.613 billion (Low-end situation)
- HKD 11.754 billion (Average situation 1)
- HKD 11.778 billion (Average situation 2)
- HKD 11.887 billion (High-end situation 1)
- HKD 11.924 billion (High-end situation 2)

To put it differently, the latent benefits incurred by the presence of the Green Deck on the two office building ranges from **HKD 151.2 million** to **HKD 461.8 million**.

Harbour Plaza Metropolis

For Harbour Plaza Metropolis, using the same conditions set for the proposed hotels in the previous section, its rentable GFA is assumed to be approximately 25,714m². Its rate is assumed to rise at 5% per annum, and its occupancy rate is set at 80%. Similar

to the evaluation of New East Ocean Centre & Concordia Plaza, owed to the proximity issue, a discount rate of 20% (on the premium incurred due to Green Deck view) is introduced.

The estimated NPVs of the hotel's rental income over 25 years, without the presence of the Green Deck, are HKD 7.053 billion⁵. With the Green Deck, however, the estimated NPVs become:

- HKD 7.135 billion (Low-end situation)
- HKD 7.212 billion (Average situation 1)
- HKD 7.225 billion (Average situation 2)
- HKD 7.285 billion (High-end situation 1)
- HKD 7.306 billion (High-end situation 2)

In other words, the latent benefits incurred by the presence of the Green Deck on the Harbour Plaza Metropolis would be between **HKD 82.7 million** and **HKD 252.6 million**.

Total latent benefits for the three buildings

Together, the total latent (indirect) benefits by means of rental income generated by these three surrounding buildings would be between **HKD 234.0 million** to **HKD 714.3 million**.

2.6.2.2 Scenario 2

This scenario, akin to Scenario 2 of the previous section, aims to evaluate how changes in interest rate (used as a proxy of the discount rate in the analysis), as well as those in rental levels, affect the additional value incurred to the three buildings surrounding the Green Deck area as a result of its construction.

New East Ocean Centre & Concordia Plaza

Akin to Scenario 2 for the evaluation of the proposed office building, some of the assumptions in Scenario 1 are modified accordingly. For instance, the suggested

⁵ It should be noted that, due to promotional packages provided by the hotels themselves or by travel agencies, the actual figure would much likely be lower than this estimate.

growth rates in Scenario 1 are to be reduced by 50%. In this scenario, the rental growth rate for office space is assumed to be 3% per annum, as opposed to 6% per annum; and the occupancy rate is to be downward adjusted from 97.5% (i.e. at 2.5% vacancy rate) to 95% (that is, at 5% vacancy rate).

Without the Green Deck, the net present value of rental income generated by these two office buildings in a 25-year period is HKD 7.130 billion. Taking it into account, the resultant NPVs of the office buildings are as follows:

- HKD 7.224 billion (Low-end situation)
- HKD 7.312 billion (Average situation 1)
- HKD 7.326 billion (Average situation 2)
- HKD 7.395 billion (High-end situation 1)
- HKD 7.418 billion (High-end situation 2)

To put it differently, the latent benefits incurred by the presence of the Green Deck on the two office buildings ranges from **HKD 94.1 million** to **HKD 287.2 million**.

Harbour Plaza Metropolis

Likewise, two adjustments are being made in the evaluation of the NPVs of the Harbour Plaza Metropolis's rental income, namely, 1) the growth in hotel rates is assumed to be 2.5% per annum, rather than 5% per annum in Scenario 1; and 2) the occupancy rate is to be lowered from 80% (Scenario 1) to 70%.

The estimated NPVs of this hotel rental income over 25 years, without the presence of the Green Deck, are HKD 4.207 billion. With the Green Deck, however, the estimated NPVs become:

- HKD 4.256 billion (Low-end situation)
- HKD 4.302 billion (Average situation 1)
- HKD 4.309 billion (Average situation 2)
- HKD 4.345 billion (High-end situation 1)
- HKD 4.357 billion (High-end situation 2)

In other words, the latent benefits incurred by the presence of the Green Deck on the Harbour Plaza Metropolis would be between **HKD 49.3 million** and **HKD 150.6**

million.

Total latent benefits for the three buildings

In summary, the total latent (indirect) benefits by means of rental income generated by these three buildings in this scenario would be between **HKD 143.4 million to HKD 437.9 million.**

Total benefits and costs

Having estimated the latent benefits incurred by means of the construction of the Green Deck to the NPVs of the rental incomes of 1) the five proposed buildings and 2) the three existing buildings surrounding the Green Deck Area which might enjoy an unblocked view, the findings show that this project, under certain assumptions and conditions, could generate possible direct benefits in terms of rental income from **HKD 208.8 million to HKD 1,022 million**; and additional indirect benefits between **HKD 143.4 million and HKD 714.3 million.** Nevertheless, according to the consultant, the total anticipated construction cost, as of April 7th 2014, ranges from **HKD 4,825 million to HKD 5,025 million.** Therefore, the additional (direct) rental income generated due to the availability of the Green Deck, within a 25-year period, amounts to 4.16%⁶-21.2%⁷ of the currently-expected construction cost.

2.7 Conclusion

In this chapter, we have described the proposed Green Deck, along with the structures and facilities expected to be constructed upon it. We have also briefly discussed the possible changes needed, in terms of land-use zoning regulations, in order to render this whole project feasible.

In addition, a cost-benefit analysis has been carried out to evaluate the latent direct

⁶ Assuming 1) the additional rental income equals the low-end figure of Scenario 2 and 2) the cost equals the high-end estimate provided by the consultant.

⁷ Assuming 1) the additional rental income equals the high-end figure of Scenario 1 and 2) the cost equals the low-end estimate provided by the consultant.

and indirect benefits the Green Deck could bring forth to the future rental income of buildings either constructed on the Green Deck or surrounding it. For the direct benefits, we have assessed the latent benefits in terms of the NPVs of the five proposed buildings, including one office building, two hotels, and two residential buildings, within a 25-year period. It is worth noting that, due to the lack of available information with regard to three of those buildings in the present, numerous assumptions and conditions are thus necessary in order to make this evaluation possible. In other words, the figures reported in this chapter should be regarded as references only. For the indirect benefits incurred by the construction of the Green Deck, the NPVs of three surrounding buildings, namely New East Ocean Centre, Concordia Plaza, and Harbour Plaza Metropolis, in a 25-year period, have been evaluated. Excluded from the evaluation, however, are the two key beneficiaries of this project: the Main Campus of the Hong Kong Polytechnic University and the Hotel ICON, with the reasons being that the Hong Kong Polytechnic University is an academic institution in which spaces are not used for commercial purpose (hence no rental income resulted); and that Hotel ICON is a research/academic-based facility owned by the Hong Kong Polytechnic University.

The findings show that, subjected to different conditions and assumptions, the project could generate direct benefits (i.e. additional rental income for the five proposed buildings constructed on the Green Deck) between HKD 208.8 million⁸ and HKD 1,022 million⁹, and indirect benefits (i.e. addition rental income for the three existing buildings in the surrounding area) from HKD 143.4 million and HKD 714.3 million (only a tiny fraction of which payable to the government via rates in the future). However, the construction cost of the whole Green Deck project, in accordance with the consultant, ranges from HKD 4,825 million to HKD 5,025 million. To put it differently, for the government, the project might yield direct benefits (in a 25-year period) amounting to 4.2-21.2% of the total anticipated construction cost of the Green Deck, in addition to a fraction of the indirect benefits payable to them in a much later date by means of rates.

⁸ Low-end estimate in Scenario 2

⁹ High-end estimate in Scenario 1

2.8 References

- Anderson, L.M. and Cordell, H.K. (1988), Influence of trees on residential property-values in Athens, Georgia (USA) — a survey based on actual sales prices, *Landscape and Urban Planning*, 15(1-2), 153-164.
- Anderson, S.T. and West, S.E., 2006. Open space, residential property values, and spatial Context, *Regional Science and Urban Economics*, 36(6), 773-789
- Bourassa, S.C., Hoesli, M., and Sun, J. (2004), What's in a view?, *Environment and Planning A*, 36, 1427-1450
- Dombrow, J., Rodriguez, M., and Sirmans, C.F. (2000), The market value of mature trees in single-family housing markets, *Appraisal Journal*, 68, 39-43
- Lutzenhiser, M. and Netusil, N.R. (2001), The Effect of Open Space on a Home's Sale Price, *Contemporary Economic Policy*, 19(3), 291-298
- Hui, E.C.M., Zhong, J.W. and Yu, K.H. (2012), The impact of landscape views and storey levels on property prices, *Landscape and Urban Planning*, 105, 86-93
- Jim, C.Y. and Chen, W.Y. (2007), Consumption preferences and environmental externalities: a hedonic analysis of the housing market in Guangzhou, *Geoforum*, 38, 414-431.
- Jim, C.Y. and Chen, W.Y. (2009), Value of scenic views: Hedonic assessment of private housing in Hong Kong, *Landscape and Urban Planning*, 91, 226-234
- Jim, C.Y. and Chen, W.Y. (2010), External effects of neighbourhood parks and landscape elements on high-rise residential value, *Land Use Policy*, 27, 662-670
- Kong, F., Yin, H., and Nakagoshi, N. (2007), Using GIS and landscape metrics in the hedonic price modeling of the amenity value of urban green space: A case study in Jinan City, China, *Landscape and Urban Planning*, 79, 240-252
- Lake, I.R., Lovett, A.A., Bateman, I.J., and Langford, I.H. (1998), Modelling environmental influences on property prices in an urban environment, *Computers, Environment and Urban Systems*, 22, 121-136
- Luttik, J. (2000), The value of trees, water and open space as reflected by house prices in the Netherlands, *Landscape and Urban Planning*, 48, 161-167
- McLeod, P.B. (1984), The demand for local amenity: an hedonic price analysis, *Environment and Planning A*, 16, 389-400
- Morales, D.J., Micha, F.R., and Weber, R.L. (1983), Two methods for valuating trees on residential sites, *Journal of Arboriculture*, 9, 21-24

Morancho, A.B. (2003), A hedonic valuation of urban green areas, *Landscape and Urban Planning*, 66, 35-41

More, T.A., Stevens, T., and Allen, P.G., (1988), Valuation of urban parks, *Landscape and Urban Planning*, 15 (1-2), 139 - 152

Sander, H., Polasky, S., and Haight, R.G. (2010), The value of urban tree cover: A hedonic property price model in Ramsey and Dakota Counties, Minnesota, USA, *Ecological Economics*, 69, 1646-1656

Tyrvaainen, L. (1997), The amenity value of the urban forest: an application of the hedonic pricing method, *Landscape and Urban Planning*, 37, 211-222