THE HONG KONG
POLYTECHNIC UNIVERSITY
香港理工大學

The Economic Contribution of the Green Deck Project

(Final Report)

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Executive Summary

The Green Deck proposed for development by The Hong Kong Polytechnic University will provide a green open space with cultural, leisure and sport facilities and amenities for local communities, commuters and different stakeholders. In this study, Green Deck visitors are categorised as converters or extenders based on their visiting purposes. If they visit Hong Kong as a direct result of the Green Deck, they are categorised as converters; if not, they are categorised as extenders. The visit intentions and expected expenditure of Green Deck visitors are collected via survey. The number of visitors for meetings, incentives, conferences and exhibitions (MICE) is estimated through interviews with industry executives. Non-tourism benefits, such as saved energy consumption, pollution reduction, health benefits and real estate rental revenue, are integrated from the findings of previous studies. These figures are used to estimate the direct and indirect revenue and value added of the Green Deck Project. This study's main findings are as follows.

➢ The direct revenue of the Green Deck is HKD58.22 billion. The indirect revenue is HKD68.47 billion. Thus, the total revenue contribution of the Green Deck to Hong Kong's economy is HKD126.69 billion, HKD124.26 billion of which is tourism revenue.

➢ The direct value added generated by the Green Deck is HKD24.71billion, approximately 0.99% of Hong Kong's 2016 GDP. The indirect value added is HKD32.68 billion. Thus, the total contribution of the Green Deck Project to Hong Kong's economy is HKD57.39 billion, HKD54.72 billion of which is tourism revenue. The total value added of the Green Deck accounts for 2.31% of Hong Kong's 2016 GDP.

➢ Every year, 23.63 million people are expected to visit the Green Deck, including 16.28 million Chinese visitors, 3.34 million non-Chinese visitors, 290,000 MICE visitors and 3.73 million Hong Kong residents.

➢ Chinese converters and extenders spend HKD4,078 and HKD1,500, respectively, on visits to the Green Deck, followed by non-Chinese visitors (HKD1,939 and HKD978, respectively) and Hong Kong residents (HKD735 and HKD75, respectively).

In summary, the Green Deck Project may significantly contribute to Hong Kong's economy in different ways, such as through tourism revenue, saved energy consumption, pollution reduction, health benefits and real estate rental revenue. Tourism dominates the impacts of the Green Deck

Project on the Hong Kong economy and international visitors. Hong Kong residents are also greatly interested in visiting the Green Deck. Although this study is only a preliminary impact analysis of the Green Deck Project, it can serve as a reference during the decision-making process.

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1. Introduction

The proposed Green Deck will occupy the site of the current Cross-Harbour Tunnel Toll Plaza, west of Hung Hom MTR Station and southeast of The Hong Kong Polytechnic University (PolyU) campus. Its area will cover approximately 43,000 m^2. The Green Deck will provide a green open space with cultural, convention, leisure and sport facilities and amenities for local communities, commuters and different stakeholders. The Green Deck will also significantly improve pedestrian and cyclist connectivity to nearby neighbourhoods, such as Hung Hom, East Tsim Sha Tsui, Homantin and King's Park, and to Hung Hom MTR Station and the waterfront (PolyU, 2016).

The Green Deck is projected to improve the environmental quality of nearby districts. It will improve air quality by collecting and removing air pollutants and will reduce traffic-related noise through the use of various acoustic devices. The Green Deck will be multi-levelled. The landscaped park and cultural, leisure and sport facilities will occupy the top level. The ground level will continue to serve cross-harbour traffic and the intermediate level will provide covered pedestrian routes, bus waiting lounges and mechanical and electrical service areas (PolyU, 2016).

2. Research Objectives

Faculty members from various disciplines at PolyU have carried out considerable research on the Green Deck Project. Research reports have measured some of the economic, socio-cultural and environmental impacts of the project. To date, no study has quantified the project's total economic contribution to tourism. Therefore, this study aims to estimate the following items:

1) The increase in visitor arrivals (both tourists and residents) as a result of the Green Deck and convention centre.
2) The contribution (i.e., direct and indirect outputs and value added) of the tourism sector to Hong Kong's economy as a result of the Green Deck Project.
3) The contribution of non-tourism sectors to Hong Kong's economy as a result of the Green Deck Project.
4) The total contribution to Hong Kong's economy as a result of the Green Deck Project.

3. Methodology

As noted previously, a considerable amount of research has been carried out on the proposed Green Deck Project. However, many of these reports outline only direct impacts. This study seeks to examine all of these components and to determine the flow-on effects of direct impacts. The framework used to estimate the economic contribution of the Green Deck is shown in Figure 1.

3.1 Estimating the Number of Additional Hong Kong Visitors as a Result of the Green Deck

To estimate the tourism revenue generated by the Green Deck Project, the number of additional Hong Kong visitors resulting from the Green Deck is estimated by multiplying visit intention by the population of potential visitors (Hong Kong visitors and residents). Visitors are further categorised as leisure or business visitors depending on their travel purposes. Business visitors include only those who come to the Green Deck for meetings, incentives, conferences and exhibitions (MICE). As mainland China is the main source of Hong Kong visitors, accounting for 75.5% of the inbound market in 2016 (Hong Kong Tourism Board [HKTB], 2017), leisure visitors are split into Chinese and non-Chinese visitors to ensure the representativeness of the samples. An online survey is conducted to ascertain the visit intentions of Chinese leisure visitors and Hong Kong residents, with a sample size of 1,000 for each group. To avoid sampling bias, an offline survey is conducted for non-Chinese leisure visitors, with a sample size of 500.

In contrast to leisure visitors and Hong Kong residents, the number of MICE visitors who will be attracted by the new convention centre is unknown. Thus, visit intention cannot be used to estimate visitor numbers for this group. Instead, in-depth interviews were carried out between 13 and 30 March 2017. The interviewees were asked to estimate the number of MICE visitors who would come to Hong Kong as a direct result of the new convention centre at the Green Deck. The interviewees included academics, senior executives from tourism-related industries and government organisations, such as PolyU, Marco Polo Hotels, China Travel Service (Hong Kong) Limited, the Hong Kong Hotels Association, the Travel Industry Council of Hong Kong and the

HKTB. The information collected thus spans a variety of stakeholders and the estimation of increased MICE visitors should be considered reliable.

3.2 Direct Revenue

The direct revenue generated by the Green Deck consists of tourism and non-tourism revenue. To estimate tourism revenue, the expected expenditure related to Green Deck visits for transportation, food and beverages, shopping, entrance to the art gallery and accommodations (only for visitors) was collected via survey. Information on the expenditure of MICE visitors was obtained from statistics released by the HKTB. The total expected expenditure is multiplied by the estimated number of Green Deck visitors to determine the direct tourism revenue generated by the project. The direct revenue generated by non-tourism sectors includes saved energy consumption, pollution reduction, health benefits and real estate rental revenue. Saved energy consumption is estimated by multiplying the saved energy by the unit price of the corresponding energy type. Pollution reduction is derived by multiplying the reduced pollution by the saved treatment cost. Information on mortality and morbidity reduced by the Green Deck is obtained from the literature. By multiplying the sum of the saved hospitalisation costs and the opportunity costs of reduced mortality and morbidity (estimated using Hong Kong statistics), the health benefits of the Green Deck are determined. Real estate rental revenue is estimated by multiplying the proposed rental area by the rental rate. The non-tourism benefits data were obtained from previous studies and the results are estimated using updated second-hand data.

3.3 Indirect Revenue

This study takes the direct revenue identified previously and adds the indirect revenue associated with the Green Deck Project to determine its total economic contribution. Based on the supply chain concept and direct revenue, the indirect revenue is calculated using various multipliers.

A multiplier is a statistical expression of how much output (or income or employment) is generated based on initial expenditure. There is no single universally applicable multiplier, but rather a multiplier for each sector of the economy. Direct spending should be allocated to the various

industries that produce the goods and services purchased by businesses, governments, residents and tourists. The value of the increase in spending for each industry is multiplied by each industry's output, income, tax and employment multipliers. The results are added to obtain the total output, income, tax and employment impacts of the increase in expenditure.

The multipliers are calculated using the Hong Kong Input-Output (I-O) tables from the Global Trade Analysis Project (GTAP) Data Base Version 7.3.2. Using these I-O multipliers, the direct and indirect revenue impacts are calculated to quantify the total economic impacts of the Green Deck Project.

3.4 GDP Contribution

As information about the operation and management costs of the Green Deck is limited, the ratios between the value added and output of the sectors related to expenditure when visiting the Green Deck, derived from the Hong Kong I-O tables, are used to estimate the value added generated by the Green Deck Project. Multipliers are introduced to calculate the indirect value added and determine the total contribution of the project to Hong Kong's GDP.
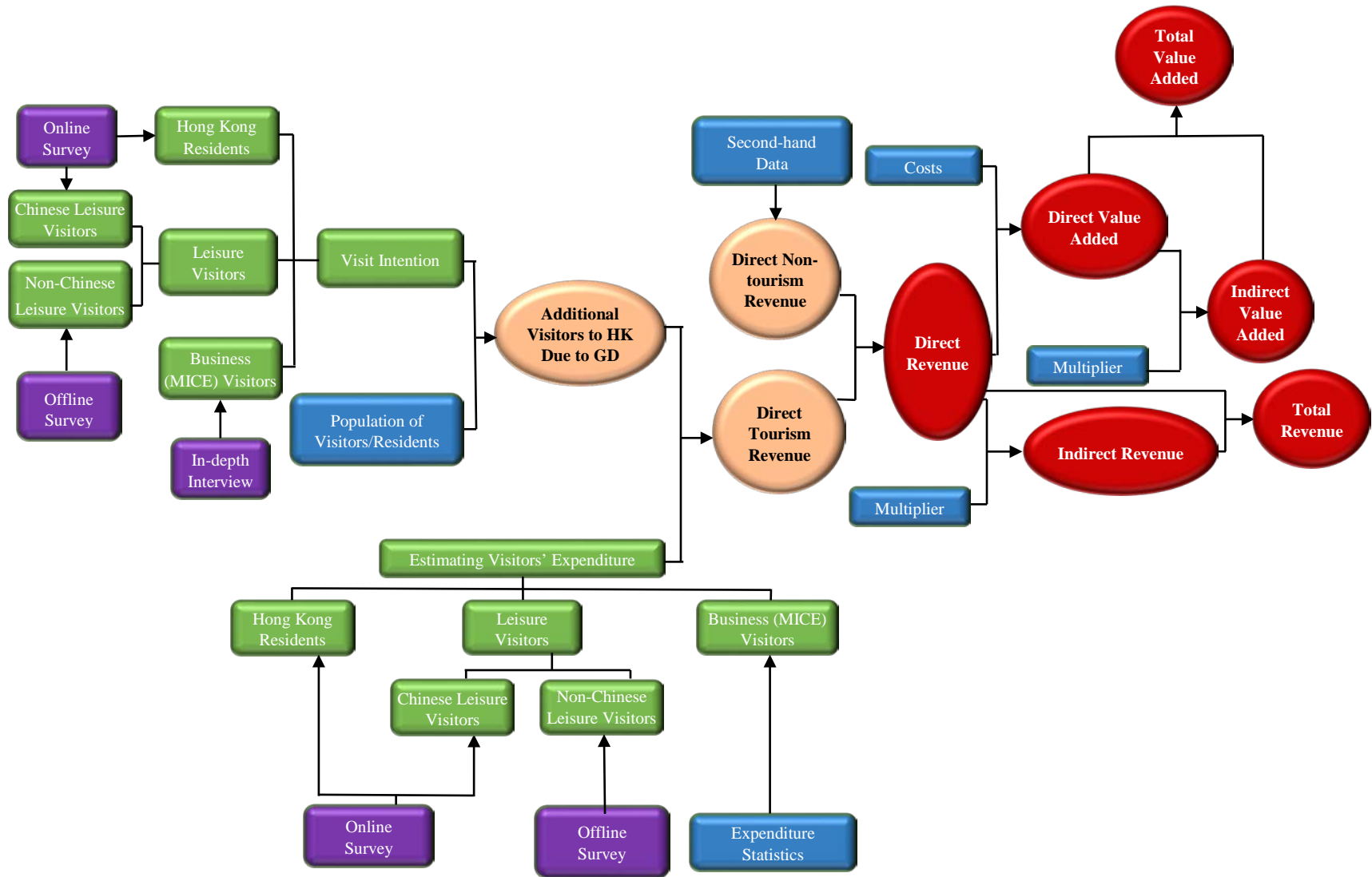
Figure 1. Process for Estimating the Economic Contribution of the Green Deck.

4. Direct Revenue Generated by the Green Deck from the Tourism Sector

4.1 Green Deck Visit Intentions

4.1.1 Sample Demographics

The intentions of leisure tourists and Hong Kong residents to visit the Green Deck were collected via online and offline surveys. The sample demographics are listed in Table 1. Most of the Chinese visitors are male (54.11%), married (78.78%), between 25 and 54 years old (76.77%), university educated (71.80%) and employed in white-collar positions as managers, professionals, associate professionals and clerks (78.49%) with a monthly income of CNY12,000 or above (60.61%). The demographic characteristics of the non-Chinese visitors are similar to those of the Chinese visitors. However, fewer of the non-Chinese visitors are married (40.43%) and their incomes are more evenly distributed. These characteristics are consistent with the profiles of Hong Kong visitors, who tend to be well-educated middle-aged professionals (HKTB, 2016). Half of the Hong Kong resident participants are male (50.40%), married (51.00%) and educated at the Bachelor's degree level or above (55.70%). Most are between 25 and 54 years old (78.60%) and employed in white-collar positions (74.5%). These figures are generally consistent with the population statistics of Hong Kong (Census and Statistics Department, 2016). The samples are thus representative of the Hong Kong visitor population and Hong Kong residents.

Table 1. Sample Demographics.

		Chinese Visitors	Non-Chinese Visitors	Hong Kong Residents
Sample Size		1,000	500	1,000
Gender	Male	54.11%	52.86%	50.40%
	Female	45.89%	47.14%	49.60%
Age	18-24	10.04%	21.10%	13.40%
	25-34	27.15%	31.56%	28.90%
	35-44	29.35%	19.92%	30.10%
	45-54	20.27%	14.00%	19.60%
	55 or above	13.19%	13.41%	8.00%
Education	Secondary school or below	1.34%	12.23%	22.20%
	Diploma/Sub-degree course	26.86%	31.95%	22.10%

	Bachelor's degree or above	71.80%	55.82%	55.70%
Marital Status	Single	18.55%	51.28%	51.00%
	Married	78.78%	40.43%	46.70%
	Others	2.68%	8.29%	2.30%
Occupation	Managers and administrators	30.11%	18.15%	15.70%
	Professionals	25.43%	31.76%	16.10%
	Associate professionals	2.20%	4.93%	11.40%
	Clerks	22.94%	2.56%	31.30%
	Service workers and shop sales workers	1.53%	7.10%	7.50%
	Craft and related workers	0.38%	0.99%	1.50%
	Plant and machine operators and assemblers	1.05%	2.17%	1.20%
	Elementary occupations	0.38%	1.78%	1.90%
	Retired	8.60%	8.88%	3.40%
	Not applicable	7.36%	21.70%	10.00%

	Chinese Visitors (CNY)		**Non-Chinese Visitors (USD)**		**Hong Kong Residents (HKD)**	
Monthly Household Income	Below 7,999	13.38%	Below 2,000	13.41%	Below 19,999	13.00%
	8,000-9,999	10.04%	2,001-4,000	18.93%	20,000-29,999	15.60%
	10,000-11,999	14.53%	4,001-5,917	16.17%	30,000-39,999	18.30%
	12,000-14,999	13.58%	5,918-9,834	14.00%	40,000-59,999	28.10%
	15,000-19,999	19.69%	9,835 or above	12.43%	60,000 or above	22.60%
	20,000 or above	27.34%				
	Prefer not to answer	1.24%	Prefer not to answer	13.21%	Prefer not to answer	1.10%
	Do not know	0.20%	Do not know	11.83%	Do not know	1.30%

4.1.2 Green Deck Visit Intentions

Different visit purposes can mean differences in visitors' willingness to visit certain attractions and visit intentions, so the Green Deck visitors are split into two subgroups based on their visit purpose. If the primary purpose of the Hong Kong visitors is to visit the Green Deck, they are categorised as 'converters', meaning they have been converted to visiting Hong Kong because of the attractiveness of the Green Deck. If visiting the Green Deck is not their primary purpose, the visitors are labelled as 'extenders'. Extenders may not come to Hong Kong to visit the Green Deck,

but may extend their stay in Hong Kong because of it. Residents are labelled as extenders when they do not purposefully visit the Green Deck, but do so when passing by.

The visit intentions of the different types of Green Deck visitors are shown in Figure 2. Both the tourists and Hong Kong residents show great interest in the Green Deck and intend to visit it. Overall, 21.03% of the Chinese visitors agree that they definitely would like to visit Hong Kong as a direct result of the Green Deck and another 16.83% think they would extend their stay because of the Green Deck. Approximately 46% of the Chinese visitors believe they would like to visit the Green Deck as converters or extenders. In addition, 22.94% of the Chinese visitors are unsure of whether they would go to Hong Kong for the Green Deck, whereas 27.63% of the Chinese extenders are neutral to the Green Deck, a figure 5% higher than the percentage of converters. In addition, 10% of the Chinese visitors do not intend to visit the Green Deck as either converters or extenders.
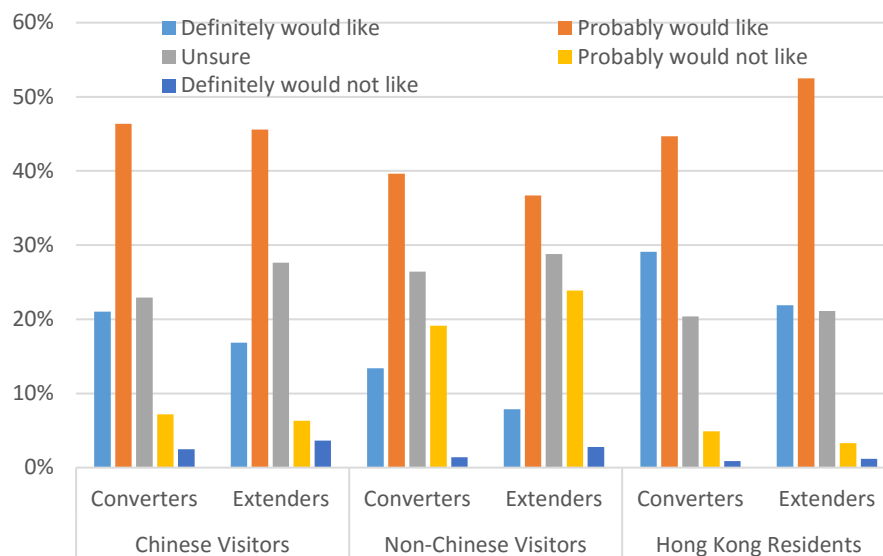

Figure 2. Green Deck Visit Intentions.

The visit intentions of the non-Chinese visitors are much lower than those of the Chinese visitors. Only 13.41% and 7.89% of the non-Chinese visitors agree that they would definitely visit the Green Deck as converters and extenders, respectively. Compared with the 46% of the Chinese

visitors who would probably like to visit the Green Deck, the proportion of the non-Chinese visitors who would so do is also lower: 39.64% for converters and 36.69% for extenders. In contrast, 19.13% of the non-Chinese visitors state that they probably would not visit Hong Kong as a direct result of the Green Deck, and 23.87% state that they probably would not extend their stay in Hong Kong due to the Green Deck (in both cases, they would do so for a different reason). Most of the non-Chinese visitors state that although the Green Deck is interesting, they are more interested in other Hong Kong attractions.

Overall, 29.10% of the Hong Kong residents would like to specifically visit the Green Deck, and 21.90% believe they would visit it when in the vicinity. Furthermore, 44.7% of the Hong Kong residents think they would probably like to visit the Green Deck as converters, whereas more than half express that they would probably visit as extenders. Approximately 20% of the residents are unsure whether they would visit the Green Deck, and another 5% of the residents do not intend to visit the Green Deck. The visit intentions of the Hong Kong residents are higher than those of the tourists, as they have lower travelling and opportunity costs.

The ratio of converters who show strong visit intentions is higher than that of extenders across all types of visitors. This indicates that the Green Deck may attract visitors with special interests, such as ecotourism and sustainable tourism. Most of the respondents' answers to why they would like to visit the Green Deck relate to its innovative green concept and green views. In contrast, most of those who were asked why they did not want to visit the Green Deck said they were not interested. Given the higher visit intentions of the Hong Kong residents, the practical implication is that the support of residents is essential for the success of the Green Deck. Furthermore, promoting the concept of sustainability may attract more visitors with related special interests.

4.1.3 Cross-tabulation Analysis of the Green Deck

To determine the potential visitors with the strongest visit intentions, cross-tabulation analysis is carried out on Hong Kong visitors and residents across various demographics and types of travel behaviour.

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4.1.3.1 Hong Kong Visitors

Figures 3 to 7 present the visit intentions of Hong Kong visitors across different demographics. Females and married couples are more likely to visit the Green Deck as both converters and extenders. The visitors between 25 and 34 years old demonstrate the strongest visit intentions. For the visitors 35 years old or above, interest in visiting the Green Deck decreases with age. The visit intentions of those with higher education and income levels are higher than other cohorts.

Figure 3. Visit Intentions of Hong Kong Visitors by Gender.

Figure 4. Visit Intentions of Hong Kong Visitors by Marital Status.

Figure 5. Visit Intentions of Hong Kong Visitors by Age.

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Figure 6. Visit Intentions of Hong Kong Visitors by Education Level.

Figure 7. Visit Intentions of Hong Kong Visitors by Income.

Figures 8 to 10 show visit intention across various types of travel behaviour. The visit intentions of the independent travellers are lower than those of the package tour travellers. The visitors with both individual and package tour travel experience show the strongest visit intentions. As travel experience and length of stay increase, visitor interest in the Green Deck increases. This means

that from a visitor's perspective, the proposed Green Deck is not currently a 'must-see' attraction, but rather a second-tier attraction for people who have visited the most popular attractions in Hong Kong or for those who are staying in Hong Kong for longer.
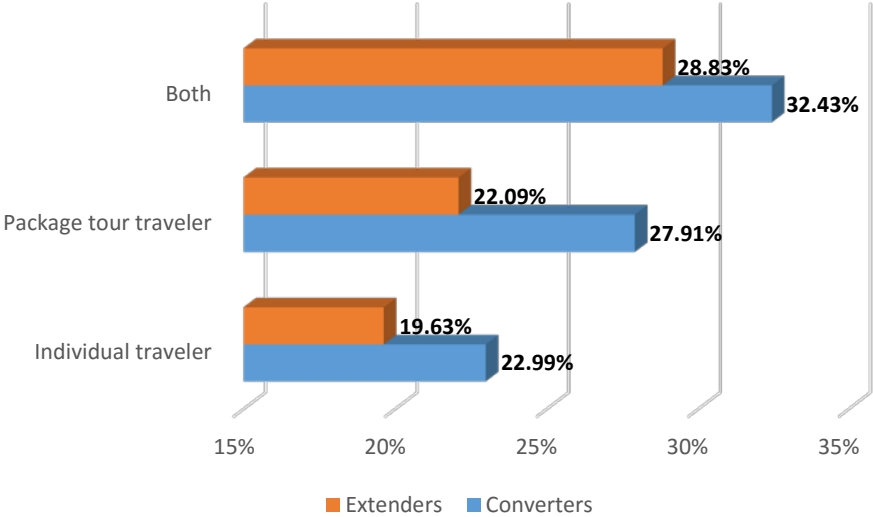
Figure 8. Visit Intentions of Hong Kong Visitors by Travel Mode.
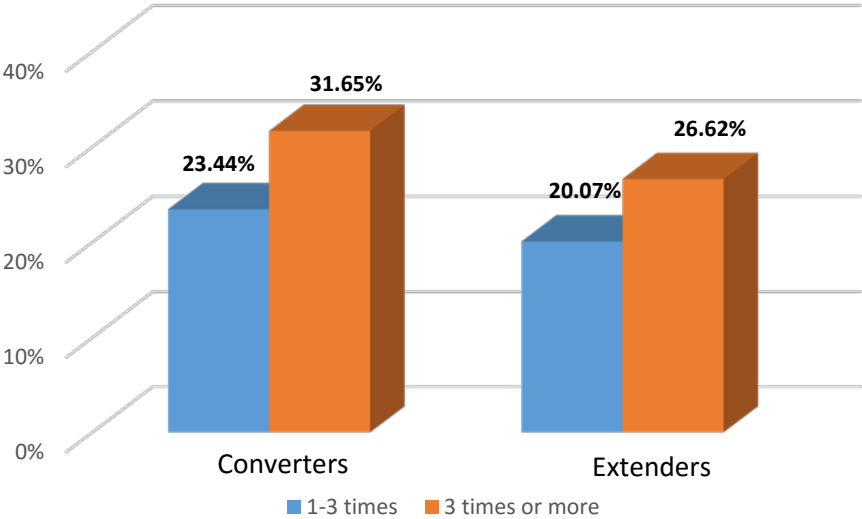
Figure 9. Visit Intentions of Repeat Visitors.
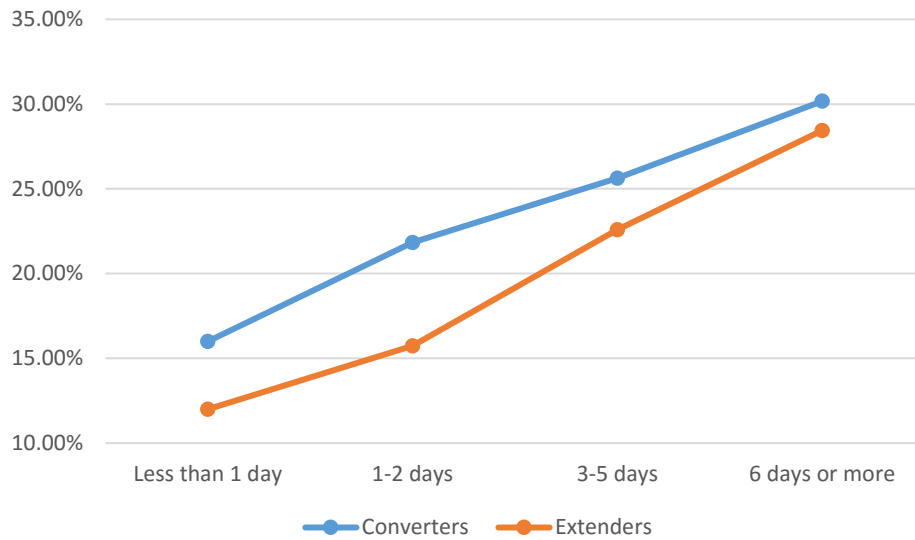
Figure 10. Visit Intentions by Length of Stay.

4.1.3.2 Hong Kong Residents

The results of the cross-tabulation analysis for the Hong Kong residents are shown in Figures 11 to 15. The male and married Hong Kong residents are more interested in visiting the Green Deck as both converters and extenders. This contrasts the visitor sample, in which females are more interested. As age increases, residents are more likely to intentionally visit the Green Deck. In particular, 41.25% of the residents 55 years old or above would definitely like to visit the Green Deck intentionally. In contrast to the visitors between 25 and 34 years old, who have the highest visit intentions, the residents 55 years old or above show the lowest visit intentions when they pass by the Green Deck area. The residents with lower or higher education levels share similar visit intentions, whereas those with diplomas or sub-degree courses show the least interest in visiting. The intentions of the residents with the lowest and highest incomes are stronger than those of the middle-class residents. This indicates that promotions and marketing strategies targeting young residents with medium levels of education and income should be developed to obtain greater support for the Green Deck from local communities.
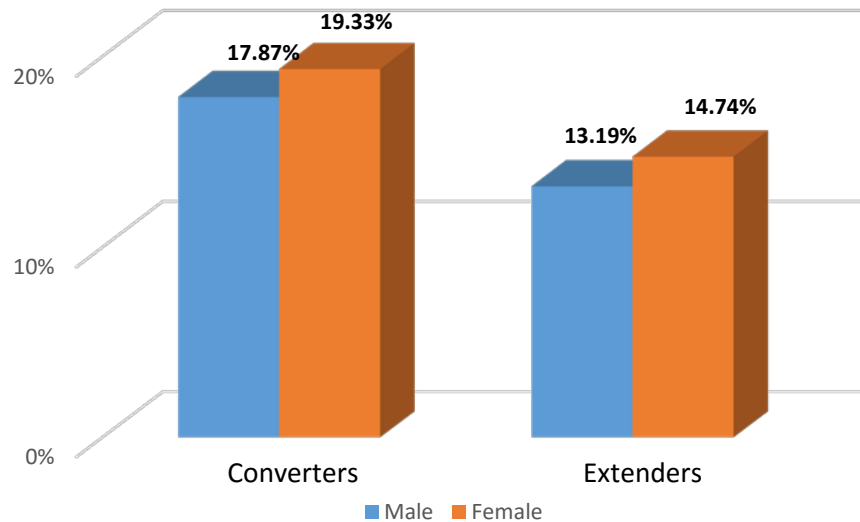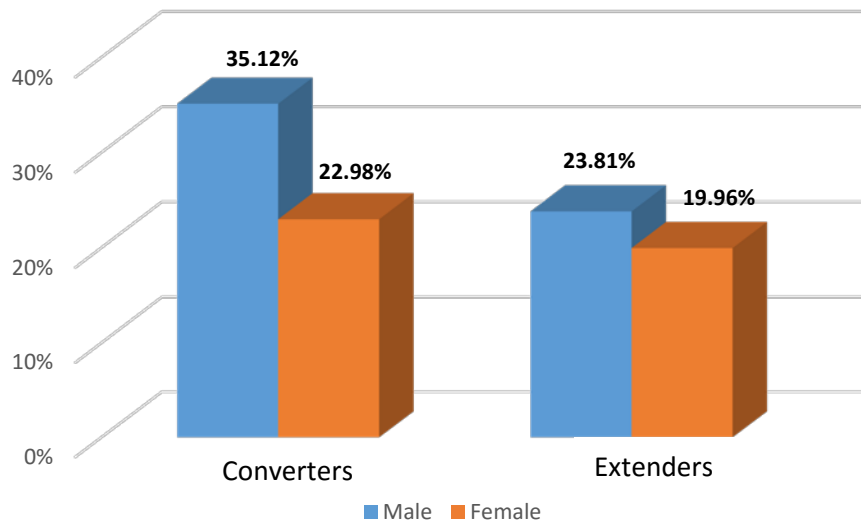
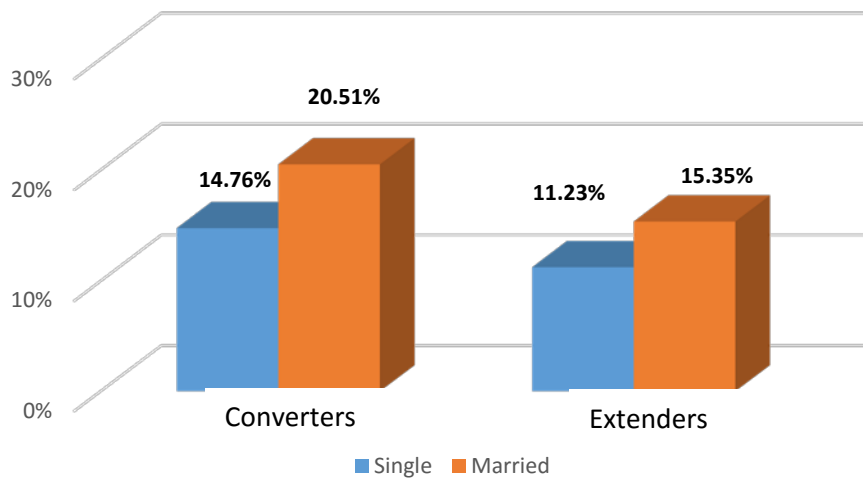Figure 11. Visit Intentions of Hong Kong Residents by Gender.
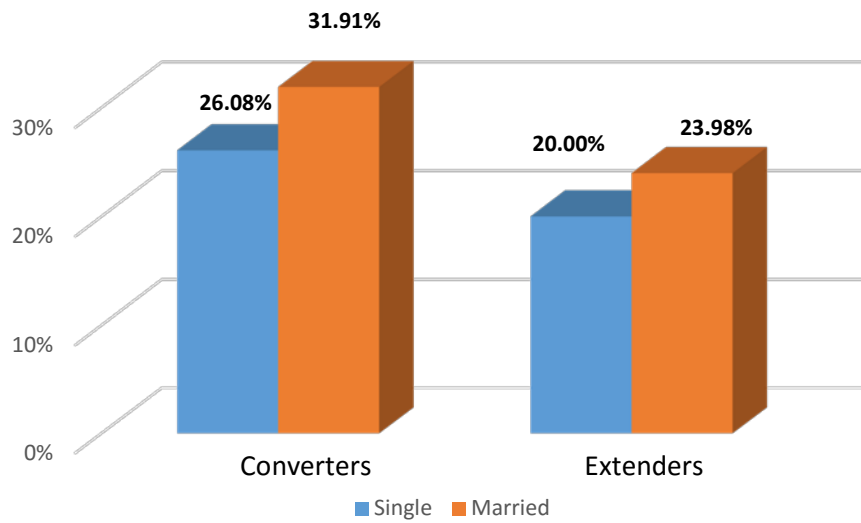
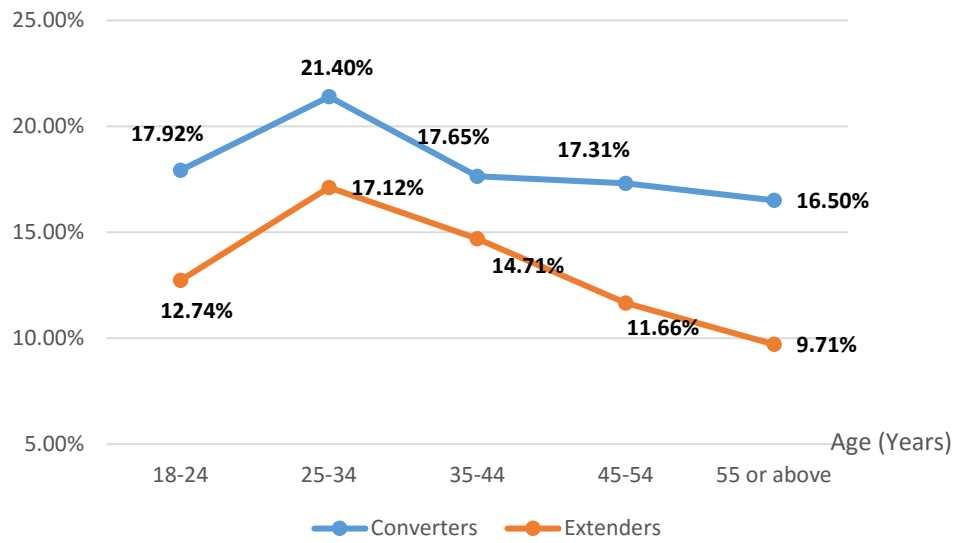Figure 12. Visit Intentions of Hong Kong Residents by Marital Status.
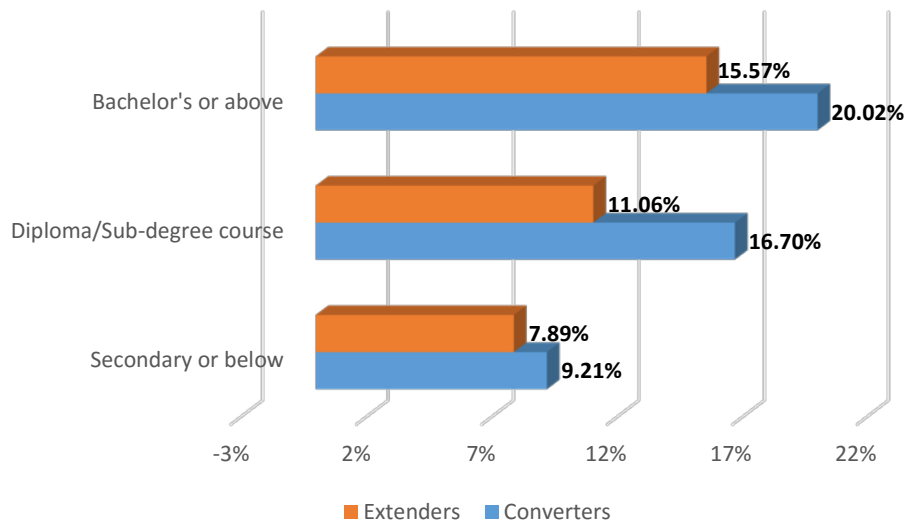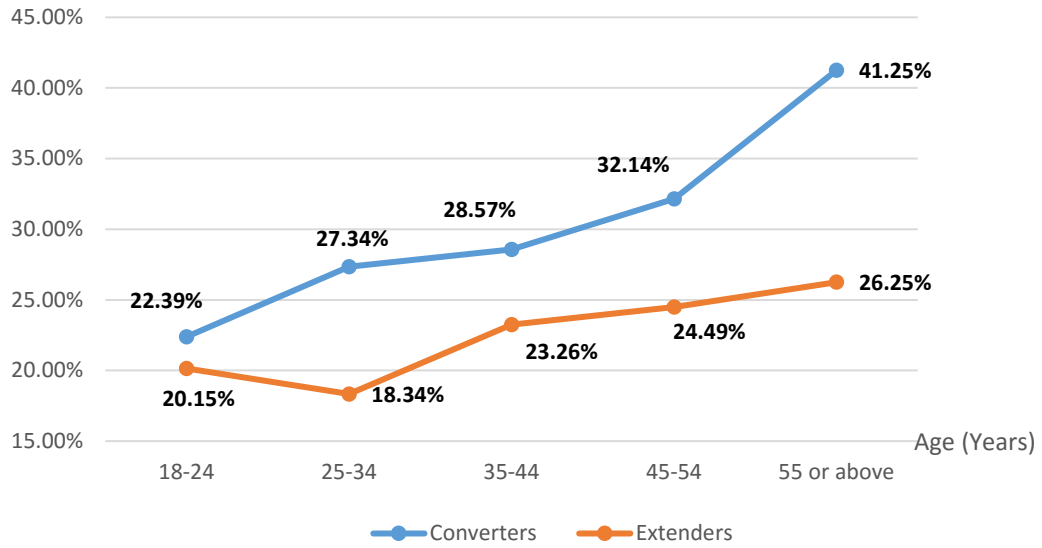
Figure 13. Visit Intentions of Hong Kong Residents by Age.

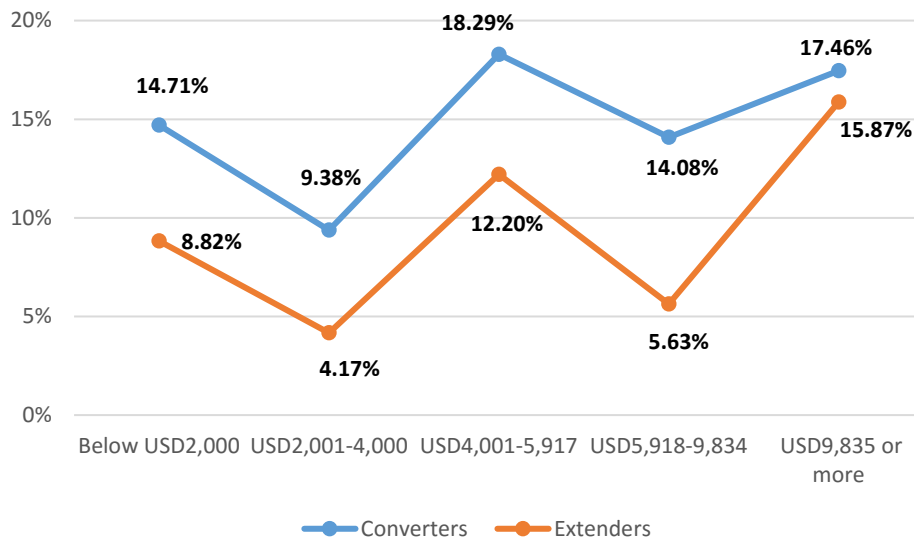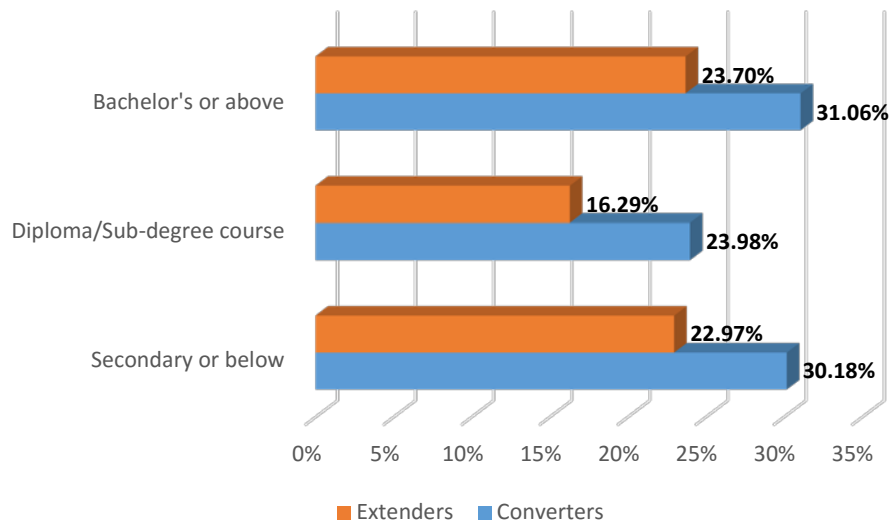Figure 14. Visit Intentions of Hong Kong Residents by Education Level.
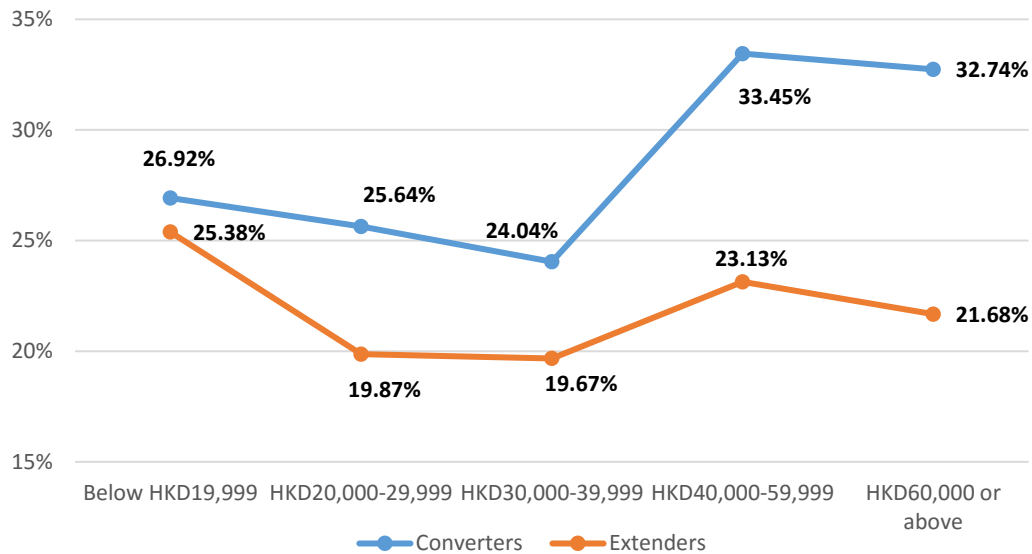
Figure 15. Visit Intentions of Hong Kong Residents by Income.

4.2 Visitor Arrivals to the Green Deck

Green Deck visitors are categorised as leisure visitors, business (MICE) visitors and Hong Kong residents. The numbers of leisure visitors and residents are estimated based on the visit intention surveys. The number of MICE visitors is estimated by experts from academia, the hospitality and travel industry and government organisations.

4.2.1 Leisure Visitors and Hong Kong Residents

4.2.1.1 Leisure Visitors

As shown in Figures 2 and 9, the intentions of the leisure visitors are quite different across source markets and travel experience. As the Chinese visitors and visitors who have more experience travelling to Hong Kong show more interest in visiting the Green Deck, it is more reasonable to calculate visitor arrivals to the Green Deck using country of origin and travel experience.

To provide a conservative estimate of the economic contribution of the Green Deck, only those respondents indicating that they would definitely like to visit the Green Deck are considered as

individuals who realise their travel behaviour. The ratios of intention to country of origin and travel experience are shown in Figure 16.
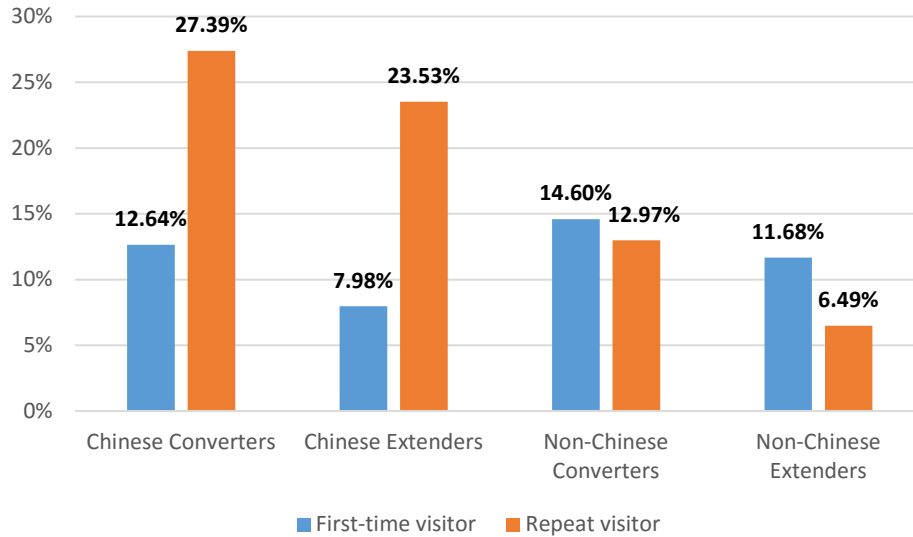
Figure 16. Visit Intentions of Leisure Visitors According to Country of Origin and Travel Experience.

The visit intentions of repeat visitors from China are higher than those of first-time visitors, whereas the contrary is true for non-Chinese visitors. Meanwhile, the visit intentions of first-time non-Chinese visitors are higher than those of Chinese visitors, whereas the intentions of non-Chinese repeat visitors are lower. These differences may be due to differing travel costs for Chinese and non-Chinese Hong Kong visitors. The financial and time costs for Chinese Hong Kong visitors are much lower than those for non-Chinese visitors. Thus, first-time Chinese visitors may like to visit other more popular attractions, whereas the Green Deck is more likely to be visited by repeat visitors. Due to high travel costs, first-time non-Chinese visitors may want to visit as many attractions as they can during their stay, making them more likely to consider the Green Deck.

To calculate the additional Hong Kong visitors as a result of the Green Deck, the visit intentions are multiplied by the visitor arrivals for each segment. The results are presented in Tables 2 and 3.

According to the HKTB (2016, 2017), 4.22 million and 30.26 million first-time and repeat visitors, respectively, travelled to Hong Kong from China for leisure purposes in 2016. Based on the visit intention information, 8.82 million Chinese visitors are expected to travel to Hong Kong as a direct result of the Green Deck and 7.46 million visitors are expected to extend their stay in Hong Kong for the Green Deck. In total, the Green Deck is expected to attract 16.28 million Chinese visitors per year. Similarly, the Green Deck may attract 3.34 million non-Chinese visitors per year.

Table 2. Number of Chinese Green Deck Visitors.

	First-Time Visitors	Repeat Visitors	Subtotal
2016 Visitor Arrivals (a)	4,219,320	30,257,328	
Converter % (b)	12.64%	27.39%	
Extender % (c)	7.98%	23.53%	
Converters (c=a*b)	533,322	8,287,482	**8,820,804**
Extenders (d=a*c)	336,702	7,119,549	**7,456,251**
Total (c+d)	**870,024**	**15,407,032**	**16,277,055**

Table 3. Number of Non-Chinese Green Deck Visitors.

	First-Time Visitors	Repeat Visitors	Subtotal
2016 Visitor Arrivals (a)	5,621,765	9,563,366	
Converter % (b)	14.60%	12.97%	
Extender % (c)	11.68%	6.49%	
Converters (c=a*b)	820,696	1,240,653	**2,061,348**
Extenders (d=a*c)	656,557	620,326	**1,276,883**
Total (c+d)	**1,477,252**	**1,860,979**	**3,338,231**

4.2.1.2 Hong Kong Residents

According to the Census and Statistics Department (2016), the residential population of Hong Kong was 7.3 million in 2015. Given the visit intentions of Hong Kong residents shown in Table 4, 2.13 million and 1.60 million Hong Kong residents are converters and extenders, respectively. An estimated 3.73 million Hong Kong residents are expected to visit the Green Deck every year.

Table 4. Number of Hong Kong Resident Green Deck Visitors.

2015 Population	7,305,700
Converter % (a)	29.10%

Extender % (b)	21.90%
Converters (c=a*b)	2,125,959
Extenders (d=a*c)	1,599,948
Total (c+d)	**3,725,907**

4.2.2 MICE Visitors

Six in-depth interviews were conducted with senior academics and executives from PolyU, Marco Polo Hotels, China Travel Service (Hong Kong) Limited, the Hong Kong Hotels Association, the Travel Industry Council of Hong Kong and the HKTB. The interviews lasted between 30 and 48 minutes. All of the experts agreed that the current convention centre capacity in Hong Kong could not meet increasing demand and that a new convention centre was definitely needed.

However, when they were asked to estimate how many new MICE visitors would be attracted by the convention centre, they expressed caution. Three interviewees stated that although the number of MICE visitors would increase significantly as a result of the Green Deck Project, they could not estimate the exact number based on the current information available, so a more detailed proposal of the convention centre was needed. Only one expert argued that the new convention centre would be unlikely to attract new visitors, stating that it would compete with the Hong Kong Convention Exhibition Centre and the AsiaWorld-Expo and absorb visitors from these two centres during low seasons. One of the two remaining experts felt that the new convention centre could attract an additional 50,000-100,000 MICE visitors to Hong Kong per year, whereas the other more optimistically believed that the number could reach 800,000 per year.

The information provided by the last three experts is considered in the estimation of MICE visitors. As shown in Table 5, the average of the numbers suggested by the experts is used to estimate the visitors generated by the Green Deck Convention Centre. (Three of the six respondents did not give precise estimates of the increased number of visitors, so their estimates are assumed to be between 0 and 800,000.) The same weight is used for each of the three experts who gave precise estimates. Thus, the average number of MICE visitors attracted by the Green Deck Convention Centre is estimated to be 291,700 per year.

Table 5. Number of MICE Visitors.

	Suggested Number of Visitors	Average of the Suggested Number	Estimated Number of MICE Visitors
Expert 4	0	0	
Expert 5	50,000-100,000	75,000	291,700
Expert 6	800,000	800,000	

Thus, as shown in Table 6, the total number of Green Deck visitors would be 23.63 million per year.

Table 6. Number of Green Deck Visitors.

	Leisure Visitors		MICE Visitors	Hong Kong Residents	Total
	Chinese Visitors	Non-Chinese Visitors			
Green Deck Visitors	16,277,055	3,338,231	291,700	3,725,907	**23,632,893**

4.3 Direct Tourism Revenue of the Green Deck

4.3.1 Expense Preferences of Leisure Visitors and Hong Kong Residents

The estimated expenditure on entrance to the art gallery, transportation, accommodations (for visitors only), food and beverages in convenience stores, food and beverages at convention centre restaurants and shopping in convention centre outlets is shown in Figures 17 to 22, respectively. In general, visitors would spend more than Hong Kong residents when visiting the Green Deck. Particularly, Chinese visitors would be willing to pay more than non-Chinese visitors.

Figure 17 shows that 26.1% of the Chinese visitors would be willing to pay HKD21-50 for the art gallery entrance fee, whereas more of the Hong Kong residents (31-32%) would prefer a free-entry art gallery. In addition, 27.3% of the non-Chinese visitors who come to Hong Kong for the Green Deck also prefer free entry, whereas 34.4% of the non-Chinese extenders would be willing to pay HKD11-20. Furthermore, 32-33% of the Chinese visitors estimate needing to pay HKD31-100 for return transport to the Green Deck, whereas more than 40% of the non-Chinese visitors and Hong Kong residents estimate only needing to pay HKD11-30 for transport (Figure 18).
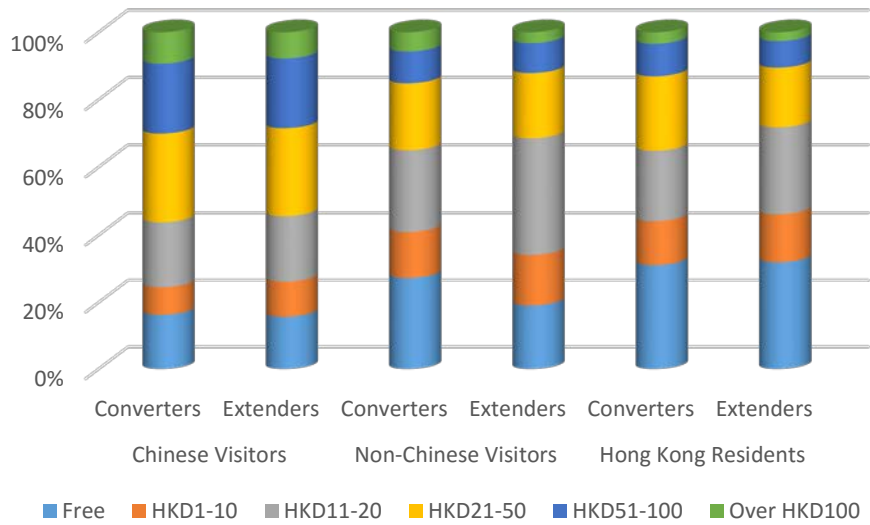
Figure 17. Estimated Expenditure of Leisure Visitors and Hong Kong Residents on an Art Gallery Entrance Fee.
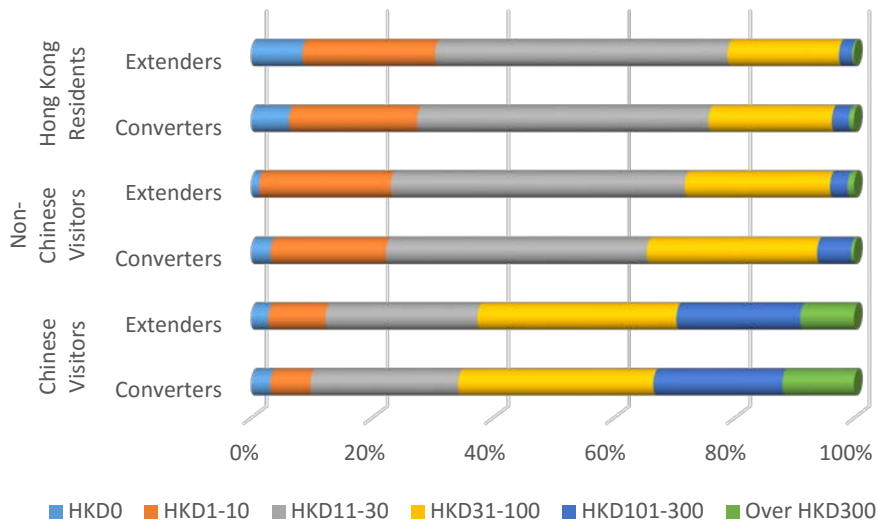
Figure 18. Estimated Expenditure of Leisure Visitors and Hong Kong Residents on Return Transport to the Green Deck.

In regards to the Green Deck visitor accommodation costs, Figure 19 shows that the most preferable room rate for both the Chinese (37%) and non-Chinese visitors (42-49%) is HKD500-1,000 per person per night. However, 16% of the Chinese visitors would prefer to pay HKD1,000-

1,500 for a one-night stay, whereas only 5.5% of the non-Chinese visitors would prefer to pay that much. Figure 20 shows that half of the Chinese visitors would pay HKD31-100 for food and beverages at Green Deck convenience stores, whereas most of the non-Chinese visitors and Hong Kong residents would be more likely to pay HKD11-50.
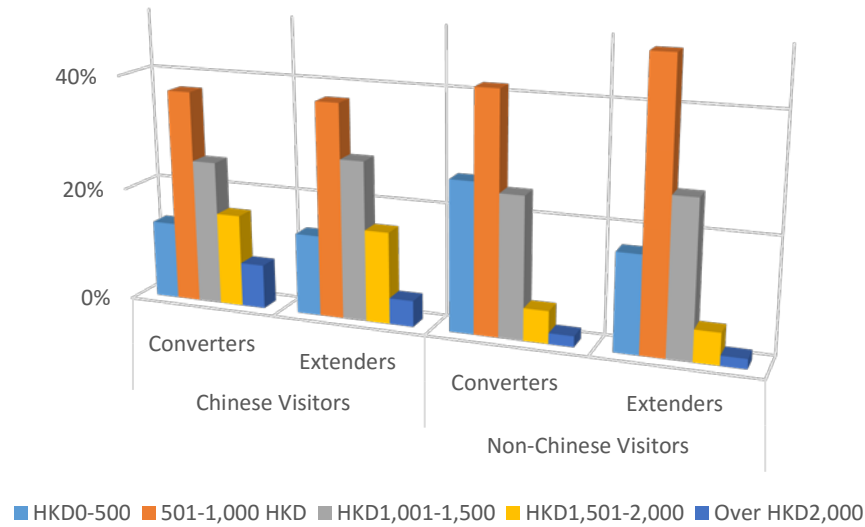
Figure 19. Estimated Accommodation Expenditure of Leisure Visitors to the Green Deck (Per Person Per Night).
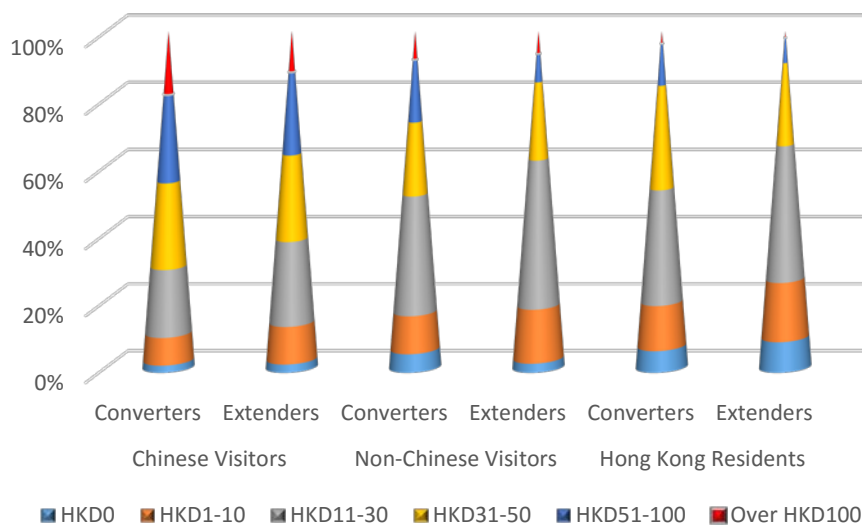
Figure 20. Estimated Expenditure of Leisure Visitors and Hong Kong Residents on Food and Beverages in Convenience Stores.

To obtain a conservative estimate of the economic impact, it is assumed that the extenders would not consume significantly in restaurants and outlets at the Green Deck, as consumers do not tend to spend too much when they visit a place unintentionally. Figure 21 shows the estimated expenditure at Green Deck restaurants. More than 60% of visitors and Hong Kong residents would prefer to spend HKD41-200. Furthermore, 22% of Chinese visitors would be happy to pay HKD201-500 for a meal at the convention centre, whereas only 11-13% of non-Chinese visitors and Hong Kong residents would be willing to pay that much. Figure 22 indicates that Chinese visitors display the strongest purchasing power when they estimate shopping expenditure. Approximately 30% of Chinese visitors believe they would spend HKD501-1,000 in Green Deck outlets and 30% would spend HKD1,000-5,000 on shopping. In contrast, approximately 38% of non-Chinese visitors and 43% of Hong Kong residents would prefer to spend only HKD101-500 on shopping.
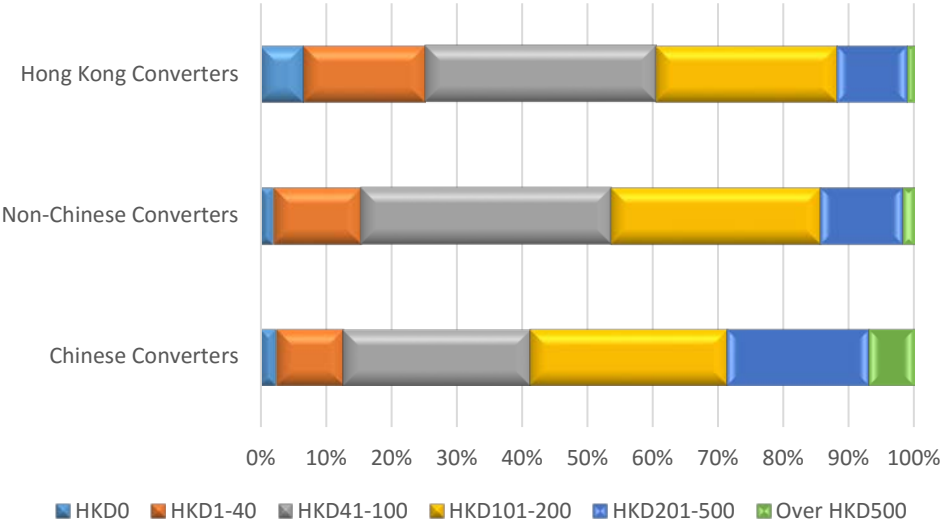
Figure 21. Estimated Expenditure of Leisure Visitors and Hong Kong Residents on Food and Beverages at Restaurants at the Convention Centre.
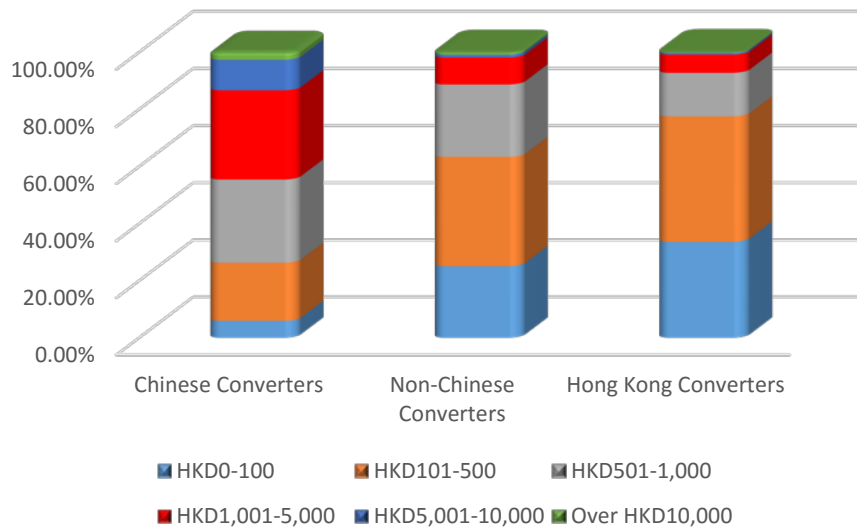
Figure 22. Estimated Expenditure of Leisure Visitors and Hong Kong Residents on Outlet Shopping at the Convention Centre.

4.3.2 *Expenditure of Green Deck Visitors*

Table 7 summarises the per capita expenditure of different types of Green Deck visitors, calculated using the amounts shown in Figures 17 to 22. The expenditure on each item is the average of the medians of the expense intervals, weighted by the visitors' preferences towards the various expense intervals. To provide a more conservative estimate of expenditure, only the lower bounds are considered for the intervals without upper bounds (i.e., more than HKD100 in Figure 17). As shown in Table 8, approximately 90% of the Chinese visitors and 80% of the non-Chinese visitors would stay at least one additional night in Hong Kong because of the Green Deck. Assuming the maximum stay is two nights, weighted by the night-stay preference, the Chinese converters and extenders would spend HKD1,407.51 and HKD1,322.08, respectively, on accommodations. The non-Chinese converters and extenders would spend HKD929.25 and HKD866.65, respectively.

The resulting per capita expenditure of Chinese visitors travelling to Hong Kong to visit the Green Deck is HKD4,078. The per capita expenditure of Chinese visitors who extend their stay in Hong Kong to visit the Green Deck is HKD1,500. The expenditure of non-Chinese visitors is lower: HKD1,939 for converters and HKD978 for extenders. Hong Kong residents who visit the Green

Deck intentionally would spend HKD735 per capita. Hong Kong residents would spend HKD75 per capita if they were to visit while passing by. According to the HKTB (2016), the average expenditure of business travellers is HKD8,846 per trip. This figure is used to represent the expenditure of MICE visitors.

Table 7. The Expenditure of Green Deck Visitors Per Capita (HKD).

	Chinese Visitors		Non-Chinese Visitors		Hong Kong Residents		MICE Visitors
	Converters	Extenders	Converters	Extenders	Converters	Extenders	
Art Gallery Entrance Fee	37.69	36.16	24.35	22.96	22.46	19.59	
Transportation Cost	105.57	95.59	41.36	36.17	32.83	28.69	
Accommodations	1,407.51	1,322.08	929.25	886.65	-	-	
Food and Beverages in Convenience Stores	52.95	46.33	38.77	31.99	32.98	26.49	8,846
Food and Beverages in Restaurants	178.06	-	130.90	-	113.64	-	
Shopping in Outlets	2,296.15	-	774.07	-	533.41	-	
Subtotal	**4,077.92**	**1,500.17**	**1,938.71**	**977.76**	**735.31**	**74.76**	

Table 8. Night-stay Preferences of Leisure Visitors to the Green Deck.

	Chinese Visitors		Non-Chinese Visitors	
	Converters	Extenders	Converters	Extenders
0 Night	12.38%	12.00%	21.34%	22.04%
1 Night	43.39%	48.51%	44.42%	54.84%
2 Nights or more	44.23%	39.49%	34.24%	23.12%
Accommodations (HKD, per capita per night)	1,067.49	1,036.97	823.05	877.22

4.3.3 Visitor Expenditure Generated by the Green Deck

As shown in Table 9, when multiplying expenditure per capita by the number of visitor arrivals, Chinese visitors dominate the direct revenue of the Green Deck, contributing HKD47.16 billion. The direct revenue generated by non-Chinese visitors is HKD5.24 billion, followed by MICE visitors and Hong Kong residents, with contributions of HKD2.58 and HKD1.68 billion, respectively. The total direct revenue of the Green Deck is estimated to be HKD56.66 billion per year.

Table 9. Visitor Expenditure Generated by the Green Deck.

	Chinese Visitors		Non-Chinese Visitors		MICE Visitors	Hong Kong Residents	
	Converters	Extenders	Converters	Extenders		Converters	Extenders
Visitor arrivals (a)	8,820,804	7,456,251	2,061,348	1,276,883	291,700	2,125,959	1,599,948
Expenditure per capita (HKD) (b)	4,077.92	1,500.17	1,938.71	977.76	8,846	735.31	74.76
Expenditure (HKD, billions) (c=a*b)	35.97	11.19	4.00	1.24	2.58	1.56	0.12
	Chinese Visitors		Non-Chinese Visitors		MICE Visitors	Hong Kong Residents	
Subtotal (HKD billion)	47.16		5.24		2.58	1.68	
Total (HKD billion)						56.66	

The direct revenue estimated by this project is much higher than estimates in previous studies (PolyU, 2016). There are two main reasons for this discrepancy. First, the Green Deck plan has been updated. When the PolyU (2016) study was carried out, the convention centre and affiliating restaurants and outlets had not been planned. Thus, the estimated expenditure of visitors in the PolyU (2016) study is only USD7 per capita. Second, the estimated revenue in this study is the potential economic contribution of the Green Deck. The results should be interpreted with caution. The Green Deck cannot be expected to generate HKD56.66 billion in revenue immediately after it is built. However, once the current plan has been completed, the Green Deck has become a popular Hong Kong attraction and the convention centre is operating successfully, the Green Deck may contribute a direct revenue of HKD56.66 billion to Hong Kong's economy.

5. Direct Revenue Generated by the Green Deck from Non-tourism Sectors

As the Green Deck is a massive and ambitious project, its benefits to the Hong Kong economy are not limited to the tourism sector. The social improvements generated by the Green Deck include saved energy consumption, pollution reduction, health benefits and real estate rental revenue from the space in the proposed convention centre rented for shops and restaurants (PolyU, 2016). The estimations of such benefits were obtained from PolyU (2016). They have been updated based on the latest Green Deck Project plans.

5.1 Saved Energy Consumption

According to Chan, Chau, Yung and Philips (2015), the Green Deck is assumed to be a cool park island that may reduce the temperature of its surrounding area by an average 0.7°C. As shown in Table 10, Fung et al. (2006) find that with decreases of 1°C, the electrical consumption of residential buildings would decline by 9.2% and gas consumption would increase by 2.4%. Temperature decreases of 1°C would lead to a 3.0% reduction in electrical consumption in commercial buildings. Chan et al. (2015) estimate that the average annual electricity consumption of a Hong Kong household is 4,610 kWh and that the annual gas consumption per household is 8,180 MJ. Chan et al. (2015) use 135.48 kWh/m^2 as the annual electricity consumption of an office building, a figure obtained from Yu, Pan, Zhao and Li (2015). Chan et al. (2015) count 5,587 residential property units (including the PolyU Hung Hom Student Hall) and 702,534 m^2 of commercial buildings in the influencing area of the Green Deck. Thus, by decreasing the temperature of the surrounding area, the Green Deck may reduce residential electrical consumption by 1,658,690.9 kWh (0.7×0.092×4,610×5,587), but increase residential gas consumption by 767,787.9 MJ (0.7×0.024×8,180×5,587). It is also expected to reduce commercial electrical consumption by 1,998,765.4 kWh (0.7×0.03×135.48×702,534). Although the ladder pricing system is applied to energy consumption in Hong Kong, as a rule of thumb, the residential and commercial electrical rates are HKD0.82/kWh and HKD1.2/kWh, respectively, and the residential gas rate is HKD0.23/MJ (Census and Statistics Department, 2017). The net energy consumption saved by the Green Deck would be HKD3.68 million (1,658,690.9×0.88-767,787.9×0.23+1,998,765.4×1.2) per year.

Table 10. Saved Energy Consumption by the Green Deck.

	Reduction Rate	Annual Consumption	Influencing Area	Average Unit Rate	Saved Energy Consumption
Residential Electrical Consumption	-9.2%	4,610 kWh/unit		HKD0.88/kWh	HKD1.46 million
Residential Gas Consumption	2.4%	8,180 MJ/unit	5,587 units	HKD0.23/MJ	HKD-0.18 million
Commercial Electrical Consumption	-3.0%	135.48 kWh/m^2	702,534 m^2	HKD1.20/kWh	HKD2.40 million

5.2 Pollution Reduction

Research has revealed that the Green Deck may decrease pollution through carbon sequestration, surface runoff reduction and traffic noise absorption (Hsu, Chan, Fan & Pratt, 2016). The contribution of the Green Deck to pollution reduction per year is summarised in Table 11. Peng and Jim (2015) investigate the average CO_2 sequestration for urban green space in Shenzhen and find that the annual sequestration rate is 25.7 tons/ha. Hsu et al. (2016) assume that the green space of the Green Deck is 3.4 ha, equating to 87.4 tons of CO_2 sequestration by the Green Deck per year. Hsu et al. (2016) use the CO_2 emission cost from the Interagency Working Group on Social Cost of Carbon (2013), which is USD38/ton (HKD300.2/ton). Thus, CO_2 sequestration may save approximately HKD26,237 (300.2×87.4) per year.

Hsu et al. (2016) estimate the annual rainfall in the Green Deck area to be 103,136 m^3. If 40% of the rainfall is runoff and the Green Deck reduces runoff by 45% (McPherson et al., 1997; Hsu et al., 2016), 18,564 m^3 (103,136×40%×45%) of water would be absorbed per year. The monetary value of the runoff reduction generated by the Green Deck can be measured by the avoided cost of treating storm water (Millward & Sabir, 2011). According to the authors, storm water treatment costs USD1.93/m^3 (HKD15.25/m^3) in Canada. Using this value, the Green Deck may save HKD283,101 (15.25×18,564) per year by reducing surface runoff.

Tang (2014) investigates the ability of the Green Deck to absorb traffic noise and concludes that it can reduce 3 dbA of noise on the PolyU campus with mitigation measures. Using the findings of Howarth et al. (2001), Hsu et al. (2016) assume that the average willingness to pay for noise reduction per decibel per person per year is USD19.78 (HKD156.26) in Europe. Hsu et al. (2016) further define the total number of full-time students and staff at PolyU as the affected population (20,933 persons). Thus, the monetary value of the noise reduction generated by the Green Deck is approximately HKD9.8 million (156.26×3×20,933). The total pollution reduction generated by the Green Deck would be HKD10.12 million.

Table 11. Pollution Reduction by the Green Deck.

	Carbon Sequestration	Surface Runoff Reduction	Noise Reduction	Total
Volume	87.4 tons	18,564 m^3	3 dbA	-
Monetary Value	HKD26,237	HKD283,101	HKD9,812,971	HKD10,122,309

5.3 Health Benefits

The Green Deck can generate health benefits for residents by reducing air pollution and temperature. According to Chan et al. (2015) and Hsu et al. (2016), the benefits of the reduced mortality and morbidity can be specified as follows:

$$Benefit_{Mortality} = Reduced\ Mortality\ (No.) \times Statistical\ Value\ of\ Life$$

$$= Reduced\ Mortality\ Rate \times Studied\ Area\ Population \times Statistical\ Value\ of\ Life;$$

$$Benefit_{Morbidity} = Reduced\ Morbidity\ (No.) \times (Hospitalisation\ Cost + Restricted\ Active\ Day)$$

$$= Reduced\ Morbidity\ Rate \times Studied\ Area\ Population \times (Hospitalisation\ Cost + Restricted\ Active\ Day).$$

In the above equations, the saved hospitalisation and opportunity costs of reduced mortality and morbidity are considered. From the perspective of the employment market, reduced mortality means extra labour supply with an economic contribution to the Hong Kong economy represented by the statistical value of life. The statistical value of life is measured by the present net value of the average annual salary per capita for the next 40 years, which is estimated as HK3,199,826 with a 5% discount rate. Similarly, if the morbidity rate is reduced, some patients may not need to stay in hospitals, but could work as usual. Their working output is measured by the restricted active day, represented by Hong Kong's 2016 GDP per capita per day, which is HKD933.46. The hospitalisation cost per capita per day is HKD1,779 and the number of residents living in the studied area is approximately 38,499, including 20,933 PolyU students and staff (Chan et al., 2015).

According to Lam (2004), the 50-μg/m^3 mortality and morbidity rate of respirable suspended particulates is 1.04%. Hsu et al. (2016) estimate that the PM10 concentration would decrease by 27.4 μg/m^3 on average as a result of the Green Deck. The resulting mortality and morbidity rate of air pollution is estimated to be 0.570% (1.04×27/50). Chan et al. (2015) also show that the mortality and morbidity rate reduced by the cool park island effect of the Green Deck is 0.682% and 0.020%. Given the population living in the influencing area (38,499), the radius of which is

500 m away from the pollution source, the benefits of the reduced mortality and morbidity of air pollution and temperature change are summarised in Table 12. The benefit of reduced mortality is much more than the benefit of reduced morbidity, which are HKD1.54 billion and HKD0.67 million, respectively. The total benefit of reduced temperature is more than the benefit of improved air pollution, which are HKD840.18 million and HKD702.72 million, respectively. In total, the health benefits generated by the Green Deck are at an estimated value of HKD1.54 billion.

Table 12. Benefits of Reduced Mortality and Morbidity (HKD million).

	Air Pollution	Temperature Change	Subtotal
Mortality	702.07	840.16	1,542.23
Morbidity	0.65	0.02	0.67
Subtotal	702.72	840.18	1,542.90

5.4 Real Estate Rental Revenue

According to the latest Green Deck development plan, the proposed hotel, apartment and offices have been replaced by a convention centre with a gross floor area of 21,500 m^2. There will be a gallery, shops and permanent displays and food and beverage areas occupying approximately 500 m^2 and 300 m^2, respectively, in the convention centre. The commercial rental rate of Grade A office buildings in the Tsim Sha Tsui region is approximately HKD43.25/month/ft^2 (Office18.com, 2017). With the 800-m^2 areas completely rented, the annual rental revenue could total HKD4.47 million (43.25×10.764×12×800).

6. Total Revenue and Value Added Generated by the Green Deck

As operation and management information on the Green Deck is limited, the ratios between the value added and output of related sectors were taken from the GTAP Data Base Version 7.3.2 to estimate the value added of the Green Deck (Table 13). The expenditure of Green Deck visitors belongs to the transportation and storage and wholesale and retail trade sectors; saved energy consumption belongs to the electricity, gas and water sector; pollution reduction belongs to the professional and support activities; health benefits belong to the community and social and personal services; and rental revenue belongs to the real estate sector. Using the ratios presented in Table 13, the value added of the revenue generated by the Green Deck is presented in Table 14.

The tourism revenue is HKD56.66 billion, generating HKD23.63 billion of value added for Hong Kong's GDP. The health benefits generated by the Green Deck are valued at HKD1.54 billion, contributing HKD1.07 billion of value added. Compared with tourism revenue, the contributions of saved energy consumption, pollution reduction and real estate rental revenue are marginal, bringing in only HKD18 million of value added. In total, the Green Deck is expected to generate HKD24.71 billion of value added, including HKD23.63 billion in tourism revenue. The total direct value added produced by the Green Deck accounts for 0.99% of Hong Kong's 2016 GDP. Although the economic contribution of non-tourism benefits is limited, they are closely related to the welfare of local residents. Without the support of the community, the Green Deck cannot be successful, indicating that enough attention should be paid to such benefits.

As presented in Table 14, using the multipliers shown in Table 13, the indirect revenue of the Green Deck is HKD68.47 billion and the tourism revenue is HKD67.60 billion. The total revenue of the Green Deck in the Hong Kong economy is HKD126.69 billion. The indirect value added generated by the Green Deck is HKD32.68 billion, 95% of which is produced by tourism revenue. In total, the value added of the Green Deck as a contribution to the Hong Kong economy is HKD57.39 billion, equivalent to 2.31% of Hong Kong's 2016 GDP.

Table 13. Ratios Between Output and Value Added and Hong Kong Multipliers.

	Ratios Between Output and Value Added	Indirect Multipliers	
		Output	Value Added
Agriculture	0.791	1.39	0.31
Manufacturing	0.643	1.65	0.29
Electricity, Gas and Water	**0.744**	**1.45**	**0.75**
Construction	0.291	2.24	0.57
Wholesale and Retail Trade	**0.421**	**2.18**	**0.76**
Transport and Storage	**0.302**	**2.57**	**0.63**
Information and Communications	0.732	1.45	0.68
Financing and Insurance	0.722	1.45	0.72
Real Estate	**0.877**	**1.25**	**0.95**
Professional and Support Activities	**0.633**	**1.68**	**0.72**
Community, Social and Personal Services	**0.694**	**1.56**	**0.68**

Table 14. Total Economic Impacts of the Green Deck (HKD billion).

	Direct Impact	Indirect Impact	Direct Value Added	Indirect Value Added
Tourism Revenue	56.66	67.60	23.63	31.09
Saved Energy Consumption	0.004	0.002	0.003	0.004
Pollution Reduction	0.010	0.007	0.006	0.009
Health Benefits	1.542	0.864	1.070	1.574
Real Estate Rental Revenue	0.004	0.001	0.004	0.004
Subtotal	**58.220**	**68.473**	**24.713**	**32.680**
Total		**126.693**		**57.393**

7. Conclusions

This study analyses the economic contribution of the Green Deck Project proposed by PolyU and can serve as a reference in the decision-making process. To estimate the economic impact of tourism revenue, the number of Hong Kong visitors and residents who would like to visit the Green Deck and their visit-related expenditure are investigated using survey data, and the number of MICE visitors is estimated via in-depth interviews with industry professionals. The contribution made by other sectors is obtained from PolyU (2016), which includes previous studies focusing on the Green Deck. The results have been integrated and updated with the latest data. With this information, the direct revenue and value added of the Green Deck are calculated. The indirect revenue and value added are further estimated using multipliers.

Tourism revenue contributes more than 95% of the economic impact generated by the Green Deck. Specifically, Green Deck visitors are categorised as converters or extenders based on their visit purposes. If they come to visit as a direct result of the Green Deck, they are categorised as converters; if not, they are categorised as extenders. Every year, 16.28 million Chinese are expected to visit the Green Deck, consisting of 8.82 million converters and 7.46 million extenders and accounting for 68.9% of the market share. Hong Kong residents also show great interest in visiting the Green Deck. An estimated 3.73 million Hong Kong residents are expected to visit the Green Deck per year, which is slightly higher than the number of non-Chinese visitors (3.34 million). Industry professionals believe that the new convention centre at the Green Deck may attract an additional 290,000 MICE visitors to Hong Kong per year.

Although Chinese visitors dominate the number of Green Deck visitors and Hong Kong residents account for only 15% of the market share, the latter are also important for the success of the Green Deck. Hong Kong has a population of 7.31 million, meaning that half of the Hong Kong population would visit the Green Deck. If local visitors are satisfied with their experiences at the Green Deck, the Green Deck will be embraced by half of all Hong Kong residents. Support from the local community is essential for the success of a new attraction. Thus, to better serve the local community in the future, it is important to promote the Green Deck Project more widely to Hong Kong residents and listen to their expectations for the project.

The Chinese visitors show the strongest potential purchasing power at the Green Deck compared with the non-Chinese visitors and Hong Kong residents. The expenditure of the Chinese visitors per capita is HKD4,078 for the converters and HKD1,500 for the extenders. For the non-Chinese converters and extenders, the expenditures are HKD1,939 and HKD978, respectively. For the Hong Kong converters and extenders, they are HKD735 and HKD75, respectively. Chinese visitors are expected to contribute HKD47.16 billion to Hong Kong as direct revenue of the Green Deck, followed by HKD5.24 billion from non-Chinese visitors and HKD1.68 billion from Hong Kong residents. Although only 290,000 MICE visitors are expected to attend the Green Deck per year (less than 10% of local visitors), they are anticipated to contribute HKD2.58 billion to the local economy.

Compared with leisure visitors and Hong Kong residents, MICE visitors constitute a high value added segment that should be encouraged. Given the shortage of convention and exhibition space in Hong Kong, the new convention centre at the Green Deck may be very successful. In interviews, industry professionals stated that the new convention centre must be well designed and equipped with the latest technology. According to five of the six experts, the size of the new convention centre should be similar to the Hong Kong Convention and Exhibition Centre and should focus more on conferences with over 5,000 delegates.

The direct value added of the Green Deck is estimated to be HKD24.71 billion, HKD23.63 billion of which is to be contributed by tourism revenue. The total direct value added is equivalent to 0.99% of Hong Kong's 2016 GDP. The indirect value added is estimated to be HKD32.68 billion, HKD31.09 billion of which is to be contributed by tourism revenue. Thus, the total value added generated by the Green Deck is estimated to be HKD57.39 billion, equalling 2.31% of Hong Kong's 2016 GDP.

This study presents a preliminary estimate of the economic contribution of the Green Deck Project to Hong Kong's economy. It has several limitations due to a lack of available information. First, as an ex ante study, it estimates visitor arrivals based on visit intentions. Second, it estimates value added and indirect revenue based on the multipliers of only six sectors. Third, it infers the impact of non-tourism benefits generated by the Green Deck from previous research. Thus, caution is needed when elaborating on such findings. Given the minor contribution of non-tourism benefits, the estimates of the total direct and indirect economic contributions of the Green Deck to Hong Kong investigated by this study must be reliable. Despite its limitations, this study outlines the Green Deck's potential economic contribution to Hong Kong and can serve as a reference in the decision-making process.

Appendices

Appendix I A Survey of Green Deck and Art Gallery Visit Intentions

Part One: Screening Questions

D1. Please indicate your gender.

☐ Female   (1)

☐ Male   (2)

D2. Please specify your age group.

☐ Below 18 (Terminate the survey)   (1)

☐ 18-24   (2)

☐ 25-34   (3)

☐ 35-44   (4)

☐ 45-54   (5)

☐ 55-64   (6)

☐ 65 or above   (7)

D3. What is your highest level of education?

☐ Primary or below   (1)

☐ Secondary school   (2)

☐ Diploma/Certificate   (3)

☐ Sub-degree course   (4)

☐ Bachelor's or above   (5)

D4.

For Western tourists

Annual Household Income (USD)

☐0-24,000 (1)

☐24,001-48,000 (2)

☐48,001-71,000 (3)

☐71,001-118,000 (4)

☐118,001-189,000 (5)

☐≥ 189,001 (6)

☐Prefer not to answer (99)

☐Do not know (999)

For Chinese tourists

Monthly Household Income (CNY)

☐Below 1,000 (1)

☐1,000-2,999 (2)

☐3,000-4,999 (3)

☐5,000-7,999 (4)

☐8,000-9,999 (5)

☐10,000-11,999 (6)

☐12,000-14,999 (7)

☐15,000-19,999 (8)

☐20,000-39,999 (9)

☐40,000-79,999 (10)

☐80,000 or above (11)

☐Prefer not to answer (99)

☐Do not know (999)

For Hong Kong residents

Monthly Household Income (HKD)

☐0-4,999 (1)

☐5,000-9,999 (2)

☐10,000-19,999 (3)

☐20,000-29,999 (4)

☐30,000-39,999 (5)

☐40,000-59,999 (6)

☐60,000 or above (7)

☐Prefer not to answer (99)

☐Do not know (999)

D5. What is your marital status?

☐Single (1)

☐Married (2)

☐Other (3)

D6. In which industry and occupation are you currently working?

☐Managers and administrators (1)

☐Professionals (2)

☐Associate professionals (3)

☐Clerks (4)

☐Service workers and shop sales workers (6)

☐Craft and related workers (7)

☐Plant and machine operators and assemblers (8)

☐Elementary occupations (9)

☐Retired (10)

☐Not applicable (99)

D7. Have you travelled to Hong Kong in the past year? (For tourists only)

☐ Yes (Go to D8_1) (1)

☐ No (Go to D8_2) (2)

D8_1. What is the travel mode you usually select when travelling to Hong Kong? (For tourists only)

☐ Individual traveller (Go to D9)   (1)

☐ Join a tour package (Go to D9)   (2)

☐ Both (Go to D9)   (3)

D8_2. Would you like to travel individually or join a package tour to Hong Kong? (For tourists only)

☐ Individual traveller (Go to D10_2)   (1)

☐ Join a tour package (Go to D10_2)   (2)

☐ Both (Go to D10_2)   (3)

D9. How many times have you travelled to Hong Kong in the past year? (For tourists only)

☐ 1-3 times (Go to D10_1)   (1)

☐ 4-6 times (Go to D10_1)   (2)

☐ 7-9 times (Go to D10_1)   (3)

☐ 10 times or more (Go to D10_1)   (4)

D10_1. How long do you stay in Hong Kong on average? (For tourists only)

☐ Less than 1 day (Go to Part Two_A)   (1)

☐ 1-2 days (Go to Part Two_A)   (2)

☐ 3-5 days (Go to Part Two_A)   (3)

☐ 6-8 days (Go to Part Two_A)   (4)

☐ 9 days or more (Go to Part Two_A)   (5)

D10_2. How long would you like to stay if you were to travel to Hong Kong? (For tourists only)

☐ Less than 1 day (Go to Part Two_A)   (1)

☐ 1-2 days (Go to Part Two_A)   (2)

☐ 3-5 days (Go to Part Two_A)   (3)

☐ 6-8 days (Go to Part Two_A)   (4)

☐ 9 days or more (Go to Part Two_A)   (5)

☐ Unsure (Go to Part Two_B)   (6)

Dear Sir/Madam,

We are now conducting a survey about intentions to visit the Green Deck and an art gallery on behalf of The Hong Kong Polytechnic University.

The proposed Green Deck will be situated in Hung Hum, Kowloon. There will be an art gallery and a convention centre with restaurants and shops. The proposed Green Deck will comprise cultural, leisure and sports facilities and amenities and serve local communities, tourists and different stakeholders. The concept plan is shown below.

[Insert Video/3D concept plan]

The information collected is confidential. It will only be used for academic research to assess the Green Deck's contribution to Hong Kong's economy. It will take you approximately **5 minutes** to complete the survey. We sincerely appreciate your participation.

Part Two_A: Visit Intention

[Phase 1]

Q1. Would you like to visit Hong Kong as **a direct result** of the Green Deck? Use a 5-point scale to rate your intention, where 1 is 'definitely would not like to go' and 5 is 'definitely would like to go'. (For tourists)

   Would you like to visit the Green Deck on purpose? Use a 5-point scale to rate your intention, where 1 is 'definitely would not like to go' and 5 is 'definitely would like to go'. (For residents)

☐ 5-Definitely would like to go (Go to Q2_1)   (1)

☐ 4-Probably would like to go (Go to Q2_1)   (2)

☐ 3-Unsure (Go to Q2_2)   (3)

☐ 2-Probably would not like to go (Go to Q2_3)   (4)

☐ 1-Definitely would not like to go (Go to Q2_3)   (5)

Q2.

Q2_1: Why would you like to visit the Green Deck? (Tourists, go to Q3_T; residents, go to Q3)

_____

Q2_2: Why are you not sure about visiting the Green Deck? (Tourists, go to Q3_T; residents, go to Q3)

_____

Q2_3: Why would you not like to visit the Green Deck? (Go to Q4)

_____

Q3_T. How many nights would you like to stay in Hong Kong as **a direct result** of the Green Deck? (For tourists only)

☐ 0   (Go to Q3 no accommodations)   (1)

☐ 1   (Go to Q3)   (2)

☐ 2 (Go to Q3) (3)

☐ 3 (Go to Q3) (4)

☐ Other Please specify_____ (Go to Q3) (99)

Q3. If you were to visit the Green Deck, please estimate how much you may spend while visiting (HKD/per person per day).

Art gallery entrance fee	Free	1-10	11-20	21-50	51-100	More than 100
Transportation (return)	0	1-10	11-30	31-100	101-300	More than 300
Accommodations	0-500	501-1,000	1,001-1,500	1,501-2,000	More than 2,000	
Food and beverages in convenience stores	0	1-10	11-30	31-50	51-100	More than 100
Food and beverages in restaurants at the convention centre	0	1-40	41-100	101-200	201-500	More than 500
Shopping in the outlets at the convention centre	0-100	101-500	501-1,000	1,001-5,000	5,001-10,000	More than 10,000

[Phase 2]

Q4. Do you think that visiting the Green Deck would encourage you to stay extra days in Hong Kong? Use a 5-point scale to rate your intention, where 1 is 'definitely would not' and 5 is 'definitely would'. (For tourists)

   Would you like to visit the Green Deck when you pass by? Use a 5-point scale to rate your intention, where 1 is 'definitely would not' and 5 is 'definitely would'. (For residents)

☐ 5-Definitely would (Go to Q5_1) (1)

☐ 4-Probably would (Go to Q5_1) (2)

☐ 3-Unsure (Go to Q5_2) (3)

☐ 2-Probably would not (Go to Q5_3) (4)

☐ 1-Definitely would not (Go to Q5_3)   (5)

Q5.

Q5_1: Why would you like to stay extra days for the Green Deck? (Go to Q6_T) (For tourists)

    Why would you like to visit the Green Deck when you pass by? (Go to Q6) (For residents)

_____

Q5_2: Why are you not sure whether you would stay extra days for the Green Deck? (Go to Q6_T) (For tourists)

    Why are you not sure whether you would visit the Green Deck when you pass by? (Go to Q6) (For residents)

_____

Q5_3: Why would you not like to stay extra days for the Green Deck? (Terminate the survey) (For tourists)

    Why would you not like to visit the Green Deck when you pass by? (Terminate the survey) (For residents)

_____

Q6_T. How many extra nights would you like to stay in Hong Kong for the Green Deck? (For tourists only)

☐ 0   (Go to Q6 no accommodations)   (1)

☐ 1   (Go to Q6)   (2)

☐ 2   (Go to Q6)   (3)

☐ 3   (Go to Q6)   (4)

☐ Other   Please specify_____ (Go to Q6)   (99)

Q6. If you were to pass by the Green Deck, please estimate how much you may spend while visiting (HKD/per person per day).

Art gallery entrance fee	Free	1-10	11-20	21-50	51-100	More than 100
Transportation (return)	0	1-10	11-30	31-100	101-300	More than 300
Accommodations	0-500	501-1,000	1,001-1,500	1,501-2,000	More than 2,000	
Food and beverages in convenience stores	0	1-10	11-30	31-50	51-100	More than 100
Food and beverages in restaurants at the convention centre	0	1-40	41-100	101-200	201-500	More than 500
Shopping in the outlets at the convention centre	0-100	101-500	501-1,000	1,001-5,000	5,001-10,000	More than 10,000

Q7. To what extent do you agree with the following statement: 'I would recommend the Green Deck to friends and relatives'. Use a 5-point scale to rate your intention, where 1 is 'definitely would not recommend' and 5 is 'definitely would recommend'.

☐ 5-Definitely would recommend   (1)

☐ 4-Probably would recommend   (2)

☐ 3-Unsure   (3)

☐ 2-Probably would not recommend   (4)

☐ 1-Definitely would not recommend   (5)

Thank you so much for your cooperation and patience.

Part Two_B: Visit Intention

(The following part is for tourists who selected 'Unsure' in D10_2)

    A. Assuming you are a same-day visitor to Hong Kong, please answer the following questions. [Phase 1]

Q8. Would you like to visit Hong Kong as **a direct result** of the Green Deck? Use a 5-point scale to rate your intention, where 1 is 'definitely would not like to go' and 5 is 'definitely would like to go'.

☐ 5-Definitely would like to go (Go to Q9_1)   (1)

☐ 4-Probably would like to go (Go to Q9_1)   (2)

☐ 3-Unsure (Go to Q9_2)   (3)

☐ 2-Probably would not like to go (Go to Q9_3)   (4)

☐ 1-Definitely would not like to go (Go to Q9_3)   (5)

Q9.

Q9_1: Why would you like to visit the Green Deck? (Go to Q10_T)

_____

Q9_2: Why are you not sure about visiting the Green Deck? (Go to Q10_T)

_____

Q9_3: Why would you not like to visit the Green Deck? (Go to Q11)

_____

Q10_T. How many nights would you like to stay in Hong Kong as **a direct result** of the Green Deck?

☐ 0   (Go to Q10 no accommodations)   (1)

☐ 1   (Go to Q10)   (2)

☐ 2   (Go to Q10)   (3)

☐ 3   (Go to Q10)   (4)

☐ Other   Please specify_____ (Go to Q10)   (99)

Q10. If you were to visit the Green Deck, please estimate how much you may spend while visiting (HKD/per person per day).

Art gallery entrance fee	Free	1-10	11-20	21-50	51-100	More than 100
Transportation (return)	0	1-10	11-30	31-100	101-300	More than 300
Accommodations	0-500	501-1,000	1,001-1,500	1,501-2,000	More than 2,000	
Food and beverages in convenience stores	0	1-10	11-30	31-50	51-100	More than 100
Food and beverages in restaurants at the convention centre	0	1-40	41-100	101-200	201-500	More than 500
Shopping in the outlets at the convention centre	0-100	101-500	501-1,000	1,001-5,000	5,001-10,000	More than 10,000

[Phase 2]

Q11. Do you think that visiting the Green Deck would encourage you to stay extra days in Hong Kong? Use a 5-point scale to rate your intention, where 1 is 'definitely would not' and 5 is 'definitely would'.

☐ 5-Definitely would (Go to Q12_1)   (1)

☐ 4-Probably would (Go to Q12_1)   (2)

☐ 3-Unsure (Go to Q12_2)   (3)

☐ 2-Probably would not (Go to Q12_3)   (4)

☐ 1-Definitely would not (Go to Q12_3)   (5)

Q12.

Q12_1: Why would you like to stay extra days for the Green Deck? (Go to Q13_T)

_____

Q12_2: Why are you not sure whether you would stay extra days for the Green Deck? (Go to Q13_T)

_____

Q12_3: Why would you not like to stay extra days for the Green Deck? (Terminate the survey)

_____

Q13_T. How many extra nights would you like to stay in Hong Kong for the Green Deck?

☐ 0   (Go to Q13 no accommodations)   (1)

☐ 1   (Go to Q13)   (2)

☐ 2   (Go to Q13)   (3)

☐ 3   (Go to Q13)   (4)

☐ Other   Please specify_____ (Go to Q13)   (99)

Q13. If you were to pass by the Green Deck, please estimate how much you may spend while visiting (HKD/per person per day).

Art gallery entrance fee	Free	1-10	11-20	21-50	51-100	More than 100
Transportation (return)	0	1-10	11-30	31-100	101-300	More than 300
Accommodations	0-500	501-1,000	1,001-1,500	1,501-2,000	More than 2,000	
Food and beverages in convenience stores	0	1-10	11-30	31-50	51-100	More than 100
Food and beverages in restaurants at the convention centre	0	1-40	41-100	101-200	201-500	More than 500
Shopping in the outlets at the convention centre	0-100	101-500	501-1,000	1,001-5,000	5,001-10,000	More than 10,000

Q14. To what extent do you agree with the following statement: 'I would recommend the Green Deck to friends and relatives'. Use a 5-point scale to rate your intention, where 1 is 'definitely would not recommend' and 5 is 'definitely would recommend'.

☐ 5-Definitely would recommend   (1)

☐ 4-Probably would recommend   (2)

☐ 3-Unsure   (3)

☐ 2-Probably would not recommend   (4)

☐ 1-Definitely would not recommend   (5)

B. Assuming you are a same-day visitor to Hong Kong, please answer the following questions.
(Repeat Questions 8-14)

Thank you so much for your cooperation and patience.

Appendix II In-depth Interview Questions – The Green Deck Project

Section 1 Warm-up

A brief introduction to the proposed Green Deck with concept images. (2-3 minutes)

Section 2 Questions regarding the Green Deck

1.   What are the opportunities for further development of the tourism industry in Hong Kong?

2.   What are the challenges to further development of the tourism industry in Hong Kong?

3.   What do you think about the proposed Green Deck as a new attraction (including the green areas, restaurants and shops)?

4.   What do you think about the art gallery on the Green Deck as a new attraction?

5.   How should the Green Deck be developed to attract more tourists and contribute to the development of the tourism industry in Hong Kong?

Section 3 Questions regarding the convention centre

1.   What are the strengths of the MICE industry in Hong Kong?

2.   What are the weaknesses of the MICE industry in Hong Kong?

3.   What are the opportunities for the MICE industry in Hong Kong?

4.   What threats is the MICE industry in Hong Kong currently facing?

5.   If a new convention centre is to be built on the Green Deck, from your perspective, what should the capacity of this convention centre be in terms of the number of people that it can hold?

6.   What auxiliary facilities should be built in addition to the convention centre?

7.   Could you roughly estimate how many overseas MICE visitors this convention centre would attract per year? (Reference – the total number of MICE visitors to Hong Kong in 2015 was 1.72 million, according to the Hong Kong Trade and Development Centre Report)

Less than 500,000

500,001-600,000

600,001-700,000

700,001-800,000

800,001-900,000

900,001-1 million

More than 1 million

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