Opinion Survey Study on External Lighting in Hong Kong

Final Report

Prepared for
Electrical and Mechanical Services Department

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Executive Summary

Background

1. The purpose of the survey is to gather views of stakeholders and the general public on external lighting. More specifically, the objectives of the survey are as follows:

a) To collect view of stakeholders and the general public on external lighting in Hong Kong;

b) To identify measures to address the concerns, if any, of stakeholders and the general public on external lighting in Hong Kong.

2. The survey was conducted on a sample of residents, neighbours of sports and recreational facilities and light sensitive groups, shop owners, property management, building owners, customers, shop goers, tourists, passers-by and sports and recreational facilities goers, and relevant associations and interest groups related to external lighting. The disproportionate sampling design was used in selecting respondents for the survey, with different selection probabilities for different groups of respondents, with a higher probability of selection used for respondents who are more likely affected by external lighting. Unbiased and representative samples with suitable focus on respondents who were likely to be affected by external lightings were selected after consideration of different factors. A total of 2,672 respondents were enumerated in the survey, with breakdown appended in the table below.

Categories of respondents	Number enumerated
Residents-in-general	526
Shop owners	670
Neighbours of sports and recreational facilities	50
Light sensitive receivers	76
Users of sports and recreational facilities	123
Customers`	641
Tourists`	202
Building owners	163
Property management	164
Interest groups, professional institutions, trade associations	57
Total	**2,672**

3. The classification covers 4 major groups of respondents who were exposed to different level of external lighting, i.e. "shop owners, property management, building owners and relevant associations on external lighting", "residents (including neighbours of sports and recreational facilities) and other light sensitive receivers relating to external lighting", "customers, shop goers, tourists, passers-by, sports and recreational facilities goers, and relevant associations relating to external lighting" and "professional institutions, interest groups and trade associations".

Stakeholder's Awareness of external lighting

4. Most stakeholders, including those who were likely to be affected by external lighting and those who were likely to own or be responsible for managing external lighting, were aware of the existence of external lighting near their residence, places of work or places they were visiting. Most of them were also aware of complaints made by some people of Hong Kong about light pollution. In addition, most of them considered that there was light pollution in Hong Kong.

5. However, only a small proportion of those stakeholders affected by external lighting had lodged complaints with government departments. The main reason for not lodging any complaint was that they did not think lodging a complaint would help.

Stakeholder's views on Extent of external lighting

Number of lighting signs

6. Less than half of the residents in general considered that the number of lighting signs of shops, advertisement signs, lighting signs of buildings or facades and large video displays or video walls was many or too many. From the perspectives of shop owners, building owners and property management, the proportion of them who considered these external lighting signs many or too many was much lower.

7. On the other hand, for those who were more affected by external lighting, especially the light sensitive receivers, as well as those who were visiting areas with more external lighting including tourists, customers and users of sports and recreational facilities, the proportion of them who considered these external lighting signs many or too many was much higher than that of residents, shop owners,

building owners and property management. The percentage ranged from as high as 68% in respect of the percentage of drivers who considered the number of lighting signs of shops many or too many to as low as 14% in respect of the proportion of neighbours of sports and recreational facilities who considered the number of advertisement signs many or too many.

Size of external lighting signs

8. 28% of residents in general considered that lighting signs of shops were big or too big. The corresponding percentage for advertisement signs was 40% and for large video displays or video walls, 39%. From the perspectives of shop owners, building owners and property management, the proportion of them who considered these external lighting signs big or too big was much lower, ranging from 10% of shop owners in respect of lighting signs of shops to 18% of property management in respect of advertisement signs.

9. On the other hand, for those who were more affected by external lighting, especially the light sensitive receivers, as well as those who were visiting areas with more external lighting including tourists, customers and users of sports and recreational facilities, the proportion of them who considered these external lighting signs big or too big, though higher than that for shop owners, building owners and property management, was mostly less than one half. The percentage was highest for residents living in areas with more external lighting in respect of lighting signs of shops (71%) and lowest for workers whose place of work was near areas with more lighting signs in respect of advertisement signs (33%).

Intensity of external lighting

10. 38% of residents in general considered that lighting signs of shops were bright or too bright. The corresponding percentage for advertisement signs was 50%; for lighting signs of buildings or facades, 41%; and for large video displays or video walls, 51%. From the perspectives of shop owners, building owners and property management, the proportion of them who considered these external lighting signs bright or too bright was mostly much lower, ranging from 50% of property management in respect of advertisement signs to 7% of property management in respect of lighting for buildings or facades.

11. On the other hand, for those who were more affected by external lighting,

especially the light sensitive receivers, as well as those who were visiting areas of intensive external lighting including tourists, customers and users of sports and recreational facilities, the proportion of them who considered these external lighting signs bright or too bright was much higher than that for shop owners, building owners and property management.

Time when external lighting was turned on

12. 23% of residents in general noted that lighting signs of shops were turned on either throughout the day or from sunset until sunrise. The corresponding percentage was higher for advertisement signs (39%), lighting for buildings or facades (43%), lighting for parks, etc. (47%) and large video displays or video walls (25%), and was about the same for floodlights of sport fields, etc. (13%). The views of shop owners, building owners and property management were not very much different and were between 17% and 59% except floodlights of sport fields on building owners and property management.

13. For residents in the light sensitive groups, namely those who were living near areas with extensive external lighting, a higher proportion noted that lighting signs of shops (52%) and advertisement signs (50%) were turned on either throughout the day or from sunset until sunrise, as compared to residents in general. In other words, residents in the light sensitive groups, who may be more likely to be affected by lighting signs of shops and advertisement signs, appeared more aware of some signs being turned on either throughout the day or from sunset until sunrise, as compared to residents in general. The corresponding percentage for lighting for buildings or facades (at 33%) was lower.

Features of external lighting

14. About 36% of residents indicated that there were features such as "shining into my building", "changing colour all the time", "flickering all the time" and "shining to the sky unnecessarily" for advertisement signs. The corresponding percentage for lighting for buildings or facades and lighting signs of shops was more or less the same, at 31% and 30% respectively.

15. A lower proportion of shop owners, building owners and property management indicated that the lighting had features, ranging from 22% of building owners in respect of lighting signs of shops to 6% of property management in respect

of lighting for buildings or facades. On the other hand, a higher proportion of those in the light sensitive groups considered that there were features such as "shining into my building", "changing colour all the time", "flickering all the time" and "shining to the sky unnecessarily" for advertisement signs, lighting signs of shops and lighting for buildings or facades, ranging from 80% of drivers in respect of lighting signs of shops and advertisement signs to 27% of those who were living near areas with extensive external lighting in respect of lighting for buildings or facades.

Adverse impact of external lighting

16. For residents in general, only a small proportion of them considered the external lighting near their place of residence had adversely affected their daily life (7%) and mental and physical health (6%). The percentage for shop owners was even lower, at 5% and 5% respectively. However, for those who were living in areas with more intensive external lighting, a higher proportion of them considered that external lighting near their place of residence or place of work had adversely affected their daily life (40%) and mental and physical health (36%).

Effect of external lighting on Hong Kong in general

17. More than half of those who were likely to be affected by external lighting as well as those who were likely to be responsible for managing external lighting had a positive view on the effect of external lighting on Hong Kong in general. For example, 78% of residents in general considered that external lighting helped beautify the environment, boost Hong Kong's image as "dynamic metropolis" and promote tourism and 87% considered that external lighting helped provide a safe environment and reduce crime by lighting up streets at night.

18. However, 76% of residents were of the view that external lighting in Hong Kong was too excessive to the extent of causing nuisance and wasting energy unnecessarily. In other words, while most residents recognized the benefits of external lighting to Hong Kong in general, they considered that external lighting were currently too excessive. Views of other stakeholders were similar, except that only 26% of tourists, 25% of customers and 15% of users of sports and recreational facilities considered that external lighting in Hong Kong was too excessive to the extent of causing nuisance and wasting energy unnecessarily.

Effectiveness of measures targeting excessive external lighting

19. Most shop owners, building owners, property management and relevant trade associations as well as residents in general considered "reduce the number of lighting", "reduce the size of lighting signs", "reduce the brightness of lighting", "lighting to be turned on only at night", "lighting to be turned off after midnight", "avoid the use of lighting or signs that flicker or change in colours" and "adjust the angle of lighting so that the light would not shine into residents' flat", effective in reducing the impact of external lighting.

20. For residents whose place of residence and workers whose place of work were in areas with more external lighting, on the other hand, a lower proportion of them considered these measures effective. In particular, less than half of residents living in areas with more external lighting considered "lighting to be turned off after midnight" and "lighting to be turned on only at night" effective.

Publicity and education

21. As regards publicity and educational measures, most shop owners, building owners, property management and relevant trade associations as well as residents in general considered measures targeted at owners of lighting such as "promote sense of social responsibility to owners of lighting so that they will take action to minimize adverse impact of external lighting on residents", "promote energy conservation so that owners of lighting will take actions to keep external lighting to a minimum" and "promote the need to preserve the natural treasure of the starry night sky so that owners of lighting will take action to minimize impact of external lighting on the sky" effective, though a lower proportion of shop owners considered measure related to the need to preserve natural treasure of the starry night effective. Educating members of the public on the adverse impact of external lighting was also considered effective by most stakeholders.

22. However, for neighbours of sports and recreational facilities, and residents whose place of residence and workers whose place of work were in areas with more external lighting, 20-44% of them considered publicity measures targeted at owners of lighting effective, though more than half of them considered educating members of the public on the adverse impact of external lighting effective. Probably this group of stakeholders believed that owners of external lighting had a vested interest in having say many, big and bright external lighting and hence considered any publicity

measures not so effective.

Self-regulation

23. The majority (65% to 96%) of shop owners, building owners, property management and relevant trade associations as well as residents in general considered measures such as "self-regulation by business community to minimize the impact of external lighting on residents" and "self-regulation by professional or trade association involved in the installation of external lighting" effective in reducing the impact of external lighting.

24. However, for those who were more affected by external lighting, including neighbours of sports and recreational facilities and light sensitive receivers, a much lower proportion of them considered these self-regulation measures effective. In particular, only 22% to 28% of residents, workers and drivers belonging to the light sensitive groups considered such self-regulation measures effective.

Actions by Government

25. Most stakeholders (60% to 89%) considered that actions by Government, including "taking action upon receipt of complaints from people affected", "issuing guidelines on external lighting" and "enacting legislations to control the installation and use of external lighting", were effective.

Recommendations

26. The following recommendations are put forward by the Consultant:

a) The Government should consider drawing up and implementing measures in addressing public concern on external lighting in Hong Kong.

b) The Government should consider setting up a one-stop mechanism for dealing with complaints from those affected by external lighting and mediate between owners of external lighting and those affected to minimize, if not eliminate, any nuisance caused by external lighting.

c) Any measures designed to reduce the impact of external lighting should be both targeted, focusing on areas where there is intensive external lighting, as well as balanced, taking into account the interests

of all parties concerned.

d) Education and publicity measures should be mounted against the excessive use of external lighting, to avoid causing nuisance, as part of the drive to promote corporate social responsibility.

e) Consideration be given to provide training to people engaged in the installation of external lighting as well as job seekers, on the design and installation of external lighting, by involving workers' and employees' associations, professional institutions and training bodies.

f) Suitable publicity and promotion activities could be considered for launch to promote the installation of glare-free and energy efficiency lighting signs by businesses.

g) The Government should adopt a multi-pronged approach in reducing the impact of external lighting, by taking action upon receipt of complaints from people affected, issuing voluntary, good practices guidelines on external lighting and in due course consider the need for enacting legislation to control the installation and use of external lighting.

h) Further investigate the need and practicality of enacting legislation to control the installation and use of external lighting, taking into account the need to have targeted and balanced approach, by focusing on areas where there is intensive external lighting and taking into account the interests of all parties concerned and regulatory burden on businesses and the community at large.

I. Background

1.1 Survey objectives

1.1 The Government has announced in the 2008/09 Policy Agenda that it plans to study the issue of energy wastage of external lighting and assess the feasibility of regulating external lighting. As such, the Government wishes to collect the views of stakeholders and the general public on external lighting. More specifically, the objectives of the survey are as follows:

a) To collect view of stakeholders and the general public on external lighting in Hong Kong;
b) To identify measures to address the concerns, if any, of stakeholders and the general public on external lighting in Hong Kong.

1.2 Survey methodology

Target respondents

1.2.1 The survey was conducted using a structured questionnaire to gather quantitative information required for the study through interviews. The target respondent groups of the survey were as follows:

a) Residents, neighbours of sports and recreational facilities and light sensitive group;
b) Shop owners, property management, building owners,
c) customers, shop goers, tourists, passers-by and sports and recreational facilities goers;
d) Relevant associations and interest groups related to external lighting.

1.2.2 The target respondent groups covered in the survey were those likely to be affected by external lighting (item (a) above), those who were owners, managers and users of external lighting for commercial or other reasons (items (b) & (c) above), or have an interest or views on matters related to external lighting (item (d) above).

Sample design

1.2.2 The approach adopted in the survey was the use of a disproportionate

sampling design in selecting respondents for the survey, with different selection probabilities for different groups of respondents, such that a higher probability of selection was accorded to respondents who were more likely affected by external lighting.

1.2.3 In addition, while ensuring that the samples of different groups of respondents are representative and unbiased, the sample design adopted was such that there was considerable "overlap", in term of geographical districts, between samples of different groups of respondents. This would facilitate comparison of views of different groups of stakeholders as they were affected by, managing or using similar external lighting conditions.

1.2.4 Following the above approach, a two-phase stratified random sampling design was adopted, with the stratification factors being intensity of external lighting, geographical districts and other variables such as nature of business and other factors relevant to the target respondents in question (e.g. whether commercial, industrial or partly commercial and partly industrial). The purpose of stratification was to ensure that respondents exposed to different extent of external lighting and of different characteristics were sampled in the survey of residents and shop owners. The sampling frames were respectively the Register of Quarters and the Register of Business Establishments maintained by the Census & Statistics Department.

1.2.5 The enumeration results of the survey conducted during the period from November to December 2009 and the response rates for different types of respondents are summarized in the table below.

Respondent groups	Number sampled	Number not eligible	Number enumerated	Response rate
Residents				
Partially commercial, partially residential	150	8	103	73%
Urban and New Towns	450	11	320	73%
Rural	150	16	103	72%
Sub-total	**750**	**25**	**526**	**73%**
Shop owners				
Apparel and clothing	171	-	136	**80%**
Electrical appliances & AV products	171	-	123	**72%**
Food & beverage and Entertainment	171	-	129	**75%**
Jewellery & Watch	171	-	126	**74%**
Other retails and Banks	171	-	156	**91%**
Sub-total	**855**	-	**670**	**78%**

1.2.6 For neighbours of sports and recreational facilities and respondents in the light sensitive groups, the quota sampling design was adopted. The quota sampling design was also adopted for users of sports and recreational facilities, tourists and customers. The enumeration results for different respondent groups conducted during the period from September to October 2009 are appended in the table below.

Respondent groups	No. of respondents enumerated
Neighbours of sports and recreational facilities	**50**
Light sensitive receivers	
Residents	25
Workers	15
Drivers	26
Astronomical observers	10
Sub-total	**76**
Users of sports and recreational facilities	**123**
Customers	**641**
Tourists	**202**
Associations of tourism and sport associations	**5**
Sub-total	**971**

1.2.7 As regards property management and building owners, they were sampled in districts in which shop owners were sampled, using the stratified sampling design, with the stratification factors being the areas were commercial, industrial, or partly commercial and partly residential. For associations, they were selected from the lists of associations of shop owners, building owners and property management. The enumeration results of the survey conducted during the period from November to December 2009 and the response rates for different types of respondents are summarized in the table below.

Respondent groups	No. sampled	No. enumerated	Response rate
Building owners			
Commercial	70	53	76%
Industrial	70	52	74%
Partly commercial and partly residential	70	58	83%
Sub-total	**210**	**163**	**78%**
Property management			
Commercial	70	56	80%
Industrial	70	54	77%
Partly commercial and partly residential	70	54	77%
Sub-total	**210**	**164**	**78%**
Relevant trade associations			
Property management	10	5	50%
Shop owner	26	16	62%
Building owner	2	1	50%
Sub-total	**38**	**22**	**58%**
Interest groups	18	14	78%
Professional institutions	5	2	40%
Other trade associations	18	14	78%
Sub-total	**41**	**30**	**73%**

1.3 Presentation of survey findings

1.3.1 This report presents the findings of the structured questionnaire survey of different groups of respondents. It may be noted that the different groups of respondents may be classified into three main categories of stakeholders, namely:

a) Those who are likely to be affected by external lighting, covering residents in general, neighbours of sports and recreational facilities and the light sensitive receivers;
b) Those who are managing external lighting such as shop owners, property management and building owners as well as those who are using external lighting in their activities and hence may encourage external lighting such as customers, tourists and users of sports and recreational facilities; and
c) Trade associations, professional institutions and interest groups that may have views and interests in matters related to external lighting.

1.3.2 In presenting the survey findings, the views and suggestions of the three categories of stakeholders will be compared and contrasted. Where appropriate, the statistics are summarized in the forms of charts and tables. It should be noted that residents and shop owners are randomly sampled to representing all residents and shop owners in Hong Kong. On the other hand, the results of the other respondent groups, with a relatively smaller sample size, may not be directly comparable with these two respondent groups.

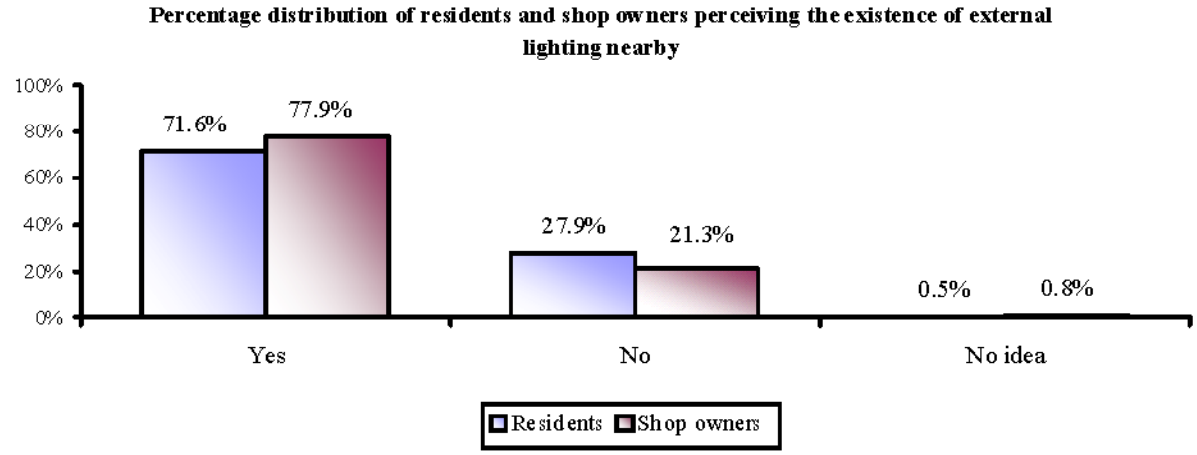
1.3.3 This report presents the main findings of the survey and is organized into the following sections.

a) Stakeholder's Awareness of external lighting;
b) Stakeholder's views on Extent of external lighting;
c) Impact of external lighting;
d) Improvement measures; and
e) Recommendations.

II. Stakeholders' Awareness of external lighting

External lighting nearby

2.1 Most residents (72%) and shop owners (78%) in Hong Kong responded that there was external lighting in the areas near their residence or shops. On the other hand, about 28% of residents and 21% shop owners considered that there was no external lighting. It should be noted that residents and shop owners are randomly sampled to representing all residents and shop owners in Hong Kong.



** Chi-square test 1*

2.2 For obvious reasons, compared with residents, a higher proportion of neighbours of sports and recreational facilities and light sensitive receivers indicated that there was external lighting near their residence, place of work or areas they were visiting. In particular, more than 90% of drivers indicated that there was external lighting while they were driving.

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1 *Chi-square test 1: The findings for residents, shop owners,neighbours of sports and recreational facilities, "light sernsitive receivers – residents, workers, drivers", building owners, property management, tourists, users of sports and recreational facilities and customers were significantly different at 0.01 significance level according to the resutls of chi-square test.*

Whether had external lighting near place of residence/operation/visiting	Yes	No	No opinion
Neighbours of sports and recreational facilities	80.0%	18.0%	2.0%
Light sensitive receivers			
Residents	84.0%	16.0%	0.0%
Workers	86.7%	13.3%	0.0%
Drivers	96.2%	3.8%	0.0%

* *Chi-square test 1*

2.3 Apart from shop owners, most building owners and property management companies responded that there was external lighting near their buildings. Most tourists, users of sports and recreational facilities and customers also indicated that there was external lighting near the places they were visiting.

Whether had external lighting near place of work/visiting	Yes	No	No opinion
Building owners	87.1%	12.3%	0.6%
Property management	93.3%	6.7%	0
Tourists	99.5%	0.5%	0
Users of sports and recreational facilities	94.3%	5.7%	0
Customers	88.2%	11.8%	0

* *Chi-square test 1*

Light pollution in Hong Kong

2.4 About 62% of residents and 61% of shop owners in Hong Kong responded that some people in Hong Kong were complaining about light pollution in Hong Kong. Apparently, complaints about light pollution were quite well known among many residents and shop owners.

** Chi-square test 2*

2.5 For those who were more likely to be affected by external lighting, it may be of interest to note that, apart from astronomical observers, a lower proportion of neighbours of sports and recreational facilities and other light sensitive receivers were aware that some people in Hong Kong were complaining about light pollution in Hong Kong. The higher proportion of astronomical observers who were aware of complaints about light pollution might be due to their being more alert to light pollution issues, as compared with other stakeholders.

Whether aware of complaints about light pollution in Hong Kong	**Yes**	**No**	**No opinion**
Neighbours of sports and recreational facilities	58.0%	36.0%	6.0%
Light sensitive receivers			
Residents	48.0%	52.0%	0
Workers	53.3%	46.7%	0
Drivers	42.3%	53.8%	3.8%
Astronomical observers	90.0%	10.0%	0

** Chi-square test 2*

2 *Chi-square test 2: The findings for residents, shop owners,neighbours of sports and recreational facilities, "light sernsitive receivers – residents, workers, drivers, astronomical observers", building owners, property management, users of sports and recreational facilities and customers, associations of property management, building owners and shop owners were significantly different at 0.01 significance level according to the resutls of chi-square test.*

2.6 Apart from shop owners, most of those who were likely to be managing or using external lighting were aware that some people in Hong Kong were complaining about light pollution in Hong Kong. In addition, the percentage of those who were aware of complaints about light pollution was higher than that for shop owners as shown in para. 2.4 above.

Whether aware of complaints about light pollution in Hong Kong	**Yes**	**No**	**No opinion**
Building owners	72.4%	19.6%	8.0%
Property management	70.7%	23.2%	6.1%
Users of sports and recreational facilities	75.6%	22.0%	2.4%
Customers	76.3%	19.0%	4.7%

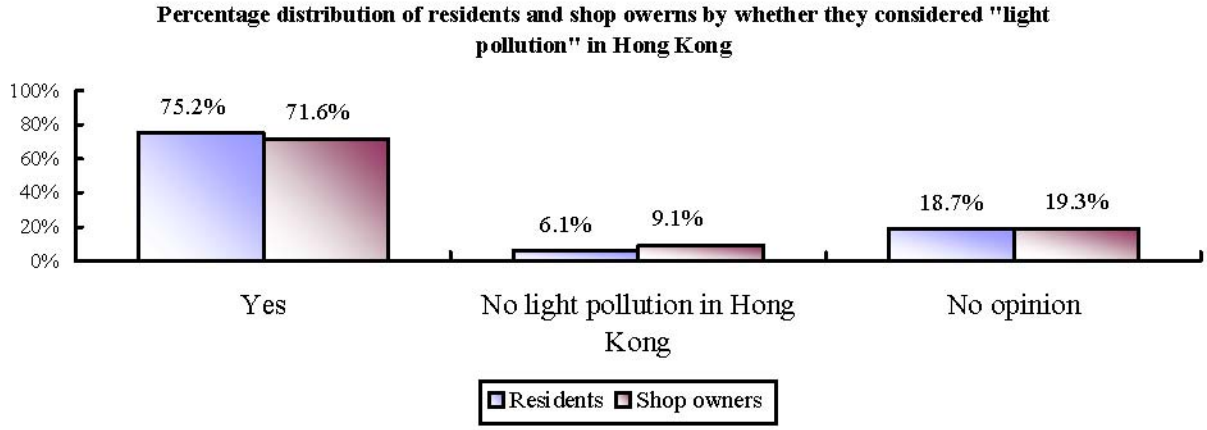
** Chi-square test 2*

2.7 For associations of property management, building owners and shop owners, more than half of them were aware that some people in Hong Kong were complaining about light pollution in Hong Kong. The percentage of these associations that were aware of complaints about light pollution was slightly higher than that for shop owners, as shown in para. 2.4 above.

Whether aware of complaints about light pollution in Hong Kong	**Yes**	**No**	**No opinion**
Associations of property management, building owners and shop owners	63.6%	31.8%	4.6%

** Chi-square test 2*

2.8 Compared with the percentage of those who were aware of complaints about light pollution, a higher proportion of residents and shop owners in Hong Kong considered that there was light pollution in Hong Kong. About 64% of residents and 53% shop owners who considered that there was light pollution were of the view that light pollution was serious or very serious.



** Chi-square test 3*

2.9 For those who were more likely to be affected by external lighting, a higher proportion of neighbours of sports and recreational facilities and light sensitive receivers considered that there was light pollution in Hong Kong, as compared with residents in general as shown in para. 2.8 above. In particular, all astronomical observers considered there was light pollution in Hong Kong.

Whether considered there was light pollution in Hong Kong	**Yes**	**No**	**No opinion**
Neighbours of sports and recreational facilities	80.0%	12.0%	8.0%
Light sensitive receivers			
Residents	84.0%	12.0%	4.0%
Workers	80.0%	13.3%	6.7%
Drivers	80.8%	11.5%	7.7%
Astronomical observers	100.0%	0	0

** Chi-square test 3*

2.10 Apart from shop owners, most of those who were likely to be managing or

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3 *Chi-square test 3: The findings for residents, shop owners,neighbours of sports and recreational facilities, "light sernsitive receivers – residents, workers, drivers, astronomical observers", building owners, property management, tourists, users of sports and recreational facilities and customers, associations of property management, building owners and shop owners, interest groups, professional institutions and other trade associations were significantly different at 0.01 significance level according to the resutls of chi-square test.*

using external lighting also considered there was light pollution in Hong Kong. In particular, more than 90% of tourists considered there was light pollution in Hong Kong.

Whether considered there was light pollution in Hong Kong	**Yes**	**No**	**No opinion**
Building owners	69.3%	8.6%	22.1%
Property management	73.8%	7.3%	18.9%
Tourist	91.6%	8.4%	0
Users of sports and recreational facilities	84.6%	5.7%	9.8%
Customers	87.5%	3.9%	8.6%

** Chi-square test 3*

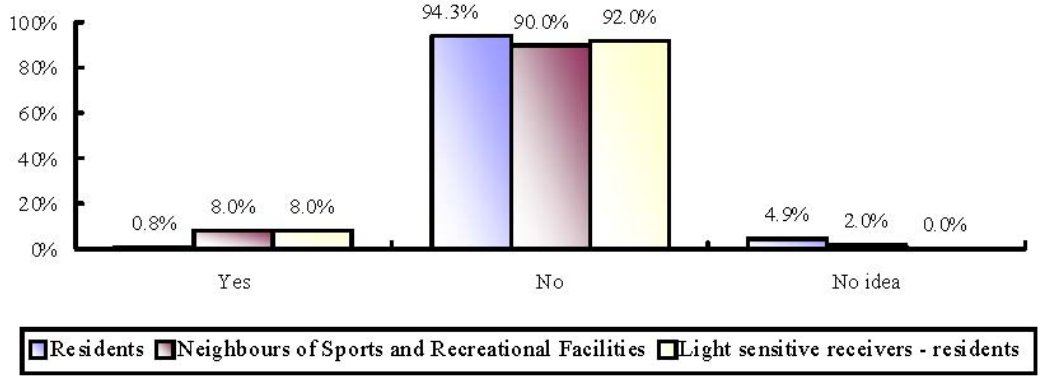
2.11 Most associations of property management, building owners and shop owners and more than 90% of interest groups, professional institutions and other trade associations considered that there was light pollution in Hong Kong.

Whether considered there was light pollution in Hong Kong	**Yes**	**No**	**No opinion**
Associations of property management, building owners and shop owners	81.8%	0	18.2%
Interest groups, professional institutions and other trade associations	96.7%	3.3%	0

** Chi-square test 3*

2.12 However, only a very small proportion of those affected by external lighting had had lodged complaints to government departments on external lighting near their residence or places of work. The percentage of residents in Hong Kong who had lodged complaints was as low as 0.8%. Only about 8% of neigbours of sports and recreational facilities and 8% of residents living near areas with more external lighting had lodged complaints. No worker working in areas with more external lighting had lodged complaints.

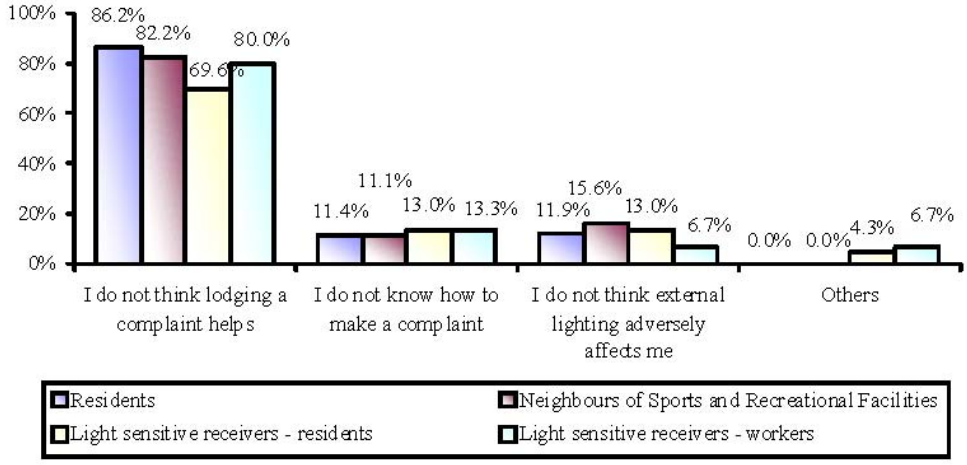
Percentage distribution of respondents by whether the respondents lodged complaints to Government departments on external lighting nearby



** Chi-square test 4*

2.13 The majority of those who did not lodge any complaints to government departments on external lighting, did not think lodging a complaint helped. About 11 - 13% indicated that they did not know how to make a complaint and a further 6 - 15% did not think external lighting had adversely affected them.

Percentage distribution of respondents by reasons for not lodging any complaints to Government departments on external lighting



** Chi-square test 5*

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4 *Chi-square test 4: The findings for residents, neighbours of sports and recreational facilities, light sensitive receivers – residents were significantly different at 0.01 significance level according to the results of chi-square test.*

5 *Chi-square test 5: The findings for residents, neighbours of sports and recreational facilities, "light sensitive receivers – residents, workers" were significantly different at 0.01 significance level according to the results of chi-square test except "Others".*

Observations

2.14 The survey findings show that both stakeholders who were likely to be affected by external lighting and those who were likely to be responsible for managing or using external lighting pointed out that there was external lighting near their residence, places of work or places they were visiting. Most of them were aware of complaints made by some people of Hong Kong about light pollution. In addition, most of them considered that there was light pollution in Hong Kong. Apparently, members of the public and related stakeholders perceived that there was light pollution in Hong Kong.

2.15 However, it was of interest to note that only a small proportion of stakeholders affected by external lighting had lodged complaints with government departments. The main reason for not lodging any complaint was that they did not think lodging a complaint would help. This sense of "helplessness" has to be addressed in dealing with nuisances related to external lighting.

III. Stakeholder' s views on Extent of external lighting

Number of external lighting signs

3.1 As regards views of stakeholders on the extent of external lighting, it may be of interest to compare the perception of those likely to be affected by external lighting and those likely to be responsible for managing external lighting. As shown in the table below, a much higher proportion of residents who were likely to be affected by external lighting considered the number of lighting signs of shops, advertisement signs, lighting for buildings or facades and large video displays or video walls was many or too many, as compared to shop owners, building owners and property management there were likely to be responsible for managing external lighting.

3.2 From the perspectives of residents, the proportion of them who considered the lighting signs of shops (27%), advertisement signs (43%), lighting signs of buildings or facades (36%) and large video displays or video walls (28%) many or too many was not small.

Many or Too many (%)	Residents	Shop owners	Building owners	Property management
Lighting signs of shops	27.3	8.8	15.7	14.9
Advertisement signs	43.3	9.8	19.1	16.5
Lighting for buildings/facades	35.7	9.5	8.9	8.8
Lighting of parks, playgrounds and public open space	7.2	7.3	3.2	11.1
Floodlight of sports fields/swimming pools	10.6	9.8	0.0	0.0
Large video displays/Video walls	27.5	6.2	0.0	0.0
External lighting of the building	--	--	6.7	3.0

** Chi-square test 6*

3.3 For those who were more affected by external lighting, especially the light sensitive receivers, the proportion of them who considered the lighting signs of shops,

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6 *Chi-square test 6: The findings for residents,shop owners, building owners, property management, neighbours of sports and recreational facilities, "light sensitive receivers – residents, workers, drivers", tourists, users of sports and recreational facilities goers and customers were significantly different at 0.01 significance level according to the resutls of chi-square test except "External lighting of the building".*

advertisement signs and lighting for buildings or facades many or too many was also higher than that for shop owners, building owners and property management. The percentage ranged from as high as 68% in respect of the percentage of drivers who considered the number of lighting signs of shops many or too many to as low as 14% in respect of the proportion of neighbours of sports and recreational facilities who considered the number of advertisement signs many or too many.

3.4 From the perspectives of residents of the light sensitive receivers who were living near areas with intensive external lighting, the proportion of them who considered the lighting signs of shops (48%), advertisement signs (43%) and lighting signs of buildings or facades (47%) many or too many was not small.

Many or Too many (%)	**Neighbours of Sports and Recreational Facilities**	**Light sensitive receivers**		
		Residents	**Workers**	**Drivers**
Lighting signs of shops	24.3	47.6	53.9	68.0
Advertisement signs	13.6	42.9	44.4	68.0
Lighting for buildings/facades	16.7	46.7	33.3	13.3
Lighting of parks, playgrounds and public open space	3.8	0.0	0.0	0.0
Floodlight of sports fields/swimming pools	4.0	0.0	0.0	15.4
Large video displays/Video walls	9.1	22.2	14.3	0.0

** Chi-square test 6*

3.5 As regards those who were visiting areas with more external lighting including tourists, customers and users of sports and recreational facilities, the proportion of them who considered the lighting signs of shops, advertisement signs and lighting for buildings or facades many or too many was also higher than that for shop owners, building owners and property management.

Many or Too many (%)	**Tourists**	**Users of sports and Recreational Facilities Goers**	**Customers**
Lighting signs of shops	53.8	61.3	37.4
Advertisement signs	54.8	20.7	39.4
Lighting for buildings/facades	41.6	16.3	35.2
Lighting of parks, playgrounds and public	13.6	13.1	12.4

open space			
Floodlight of sports fields/swimming pools	17.0	14.6	24.4
Large video displays/ video walls	28.8	5.6	30.6

* *Chi-square test 6*

Size of external lighting signs

3.6 A much higher proportion of residents considered the size of lighting signs of shops, advertisement signs and large video displays or video walls were big or too big, as compared to shop owners, building owners and property management. From the perspectives of residents, the proportion of them who considered lighting signs of shops (28%), advertisement signs (40%), and large video displays or video walls (39%) big or too big was not small.

Big or Too big (%)	**Residents**	**Shop owners**	**Building owners**	**Property management**
Lighting signs of shops	28.1	9.8	11.3	15.7
Advertisement signs	40.0	13.1	15.7	17.6
Floodlight of sports fields/swimming pools	8.8	11.5	0.0	0.0
Large video displays/Video walls	38.6	9.3	6.7	0.0
External lighting of the building	--	--	5.3	5.0

* *Chi-square test 7*

3.7 For those who were more affected by external lighting, especially the light sensitive receivers, the proportion of them who considered the size of lighting signs of shops and advertisement signs big or too big in general was also higher than that for shop owners, building owners and property management.

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7 *Chi-square test 7: The findings for residents,shop owners, building owners, property management, neighbours of sports and recreational facilities, "light sensitive receivers – residents, workers, drivers", tourists, users of sports and recreational facilities goers and customers were significantly different at 0.01 significance level according to the resutls of chi-square test except "External lighting of the building".*

Big or Too big (%)	Neighbours of Sports and Recreational Facilities	Light sensitive receivers		
		Residents	Workers	Drivers
Lighting signs of shops	27.0	71.4	38.5	52.0
Advertisement signs	22.7	57.1	33.3	60.0
Floodlight of sports fields/swimming pools	12.0	33.3	0.0	30.8
Large video displays/Video walls	0.0	11.1	28.6	0.0

* *Chi-square test 7*

3.8 For those who were visiting areas of more external lighting including tourists, customers and users of sports and recreational facilities, the proportion of them who considered the size of lighting signs of shops, advertisement signs and large video displays or video walls big or too big was also much higher than that for shop owners, building owners and property management.

Big or Too big (%)	Tourists	Users of sports and Recreational Facilities Goers	Customers
Lighting signs of shops	43.3	54.8	29.5
Advertisement signs	47.2	27.5	32.6
Floodlight of sports fields/swimming pools	18.9	8.3	28.9
Large video displays/Video walls	34.6	11.1	31.4

* *Chi-square test 7*

Intensity of external lighting

3.9 A much higher proportion of residents considered the lighting signs of shops, advertisement signs, lighting for buildings or facades and large video displays or video walls were bright or too bright, as compared to shop owners, building owners and property management. From the perspectives of residents, the proportion of them who considered lighting signs of shops (38%), advertisement signs (50%), lighting for buildings or facades (41%) and large video displays or video walls (51%) bright or too bright was not small.

Bright or Too bright (%)	Residents	Shop owners	Building owners	Property management
Lighting signs of shops	38.3	12.2	10.4	17.9
Advertisement signs	50.1	12.8	14.6	18.8
Lighting for buildings/facades	41.4	9.1	10.1	7.4
Lighting of parks, playgrounds and public open space	7.8	4.5	6.5	3.7
Floodlight of sports fields/swimming pools	16.2	5.1	0.0	0.0
Large video displays/Video walls	50.9	8.7	20.0	50.0
External lighting of the building	--	--	8.0	5.0
Overall brightness of the district	9.8	4.3	6.7	7.9

** Chi-square test 8*

3.10 For those who were more affected by external lighting, especially the light sensitive receivers, the proportion of them who considered the lighting signs of shops, advertisement signs and lighting for buildings or facades bright or too bright in general was also much higher than that for shop owners, building owners and property management. For residents and workers whose places of residence or work were in areas with intensive external lighting, a higher proportion of them considered large video displays or video walls bright or too bright. A higher proportion of them also considered the district where they lived or worked was bright or too bright.

8 *Chi-square test 8: The findings for residents,shop owners, building owners, property management, neighbours of sports and recreational facilities, "light sensitive receivers – residents, workers, drivers", tourists, users of sports and recreational facilities goers and customers were significantly different at 0.01 significance level according to the resutls of chi-square test except "External lighting of the building".*

Bright or Too bright (%)	Neighbours of Sports and Recreational Facilities	Light sensitive receivers		
		Residents	Workers	Drivers
Lighting signs of shops	43.2	76.2	61.6	52.0
Advertisement signs	40.9	71.4	55.5	52.0
Lighting for buildings/facades	33.3	60.0	50.0	13.3
Lighting of parks, playgrounds and public open space	23.1	0.0	0.0	8.3
Floodlight of sports fields/swimming pools	20.0	0.0	0.0	7.7
Large video displays/Video walls	9.1	33.3	57.2	0.0
Overall brightness of the district	10.0	38.1	30.8	--

** Chi-square test 8*

3.11 For those who were visiting areas of more external lighting including tourists, customers and users of sports and recreational facilities, the proportion of them who considered the lighting signs of shops, advertisement signs and lighting for buildings or facades bright or too bright was also much higher than that for shop owners, building owners and property management. For tourists and customers, a higher proportion of them considered large video displays or video walls bright or too bright. A higher proportion of them also considered the district they were visiting was bright or too bright.

Bright or Too bright (%)	Tourists	Users of sports and Recreational Facilities	Customers
Lighting signs of shops	46.3	58.1	40.2
Advertisement signs	45.6	37.9	42.7
Lighting for buildings/facades	42.2	13.2	40.6
Lighting of parks, playgrounds and public open space	11.5	10.8	18.4
Floodlight of sports fields/swimming pools	17.0	19.3	30.9
Large video displays/Video walls	31.7	11.1	42.5
Overall brightness of the district	40.3	15.6	28.6

** Chi-square test 8*

Time when external lighting was turned on

3.12 Lighting signs of shops were perceived to be turned on either throughout the day or from sunset until sunrise by 23% of residents in general. The corresponding percentage was higher for advertisement signs (39%), lighting for buildings or facades (43%), lighting for parks, etc. (47%) and large video displays or video walls (25%), and was about the same for floodlights of sport fields, etc. (13%). The views of shop owners, building owners and property management were not very much different and were between 17% and 59% except floodlights of sport fields on building owners and property management., indicating that those were likely to be affected by external lighting and those who were likely to be responsible for managing external lighting recognized that there were external lighting signs that were turned on throughout the day or after midnight.

External lighting (%)		**Residents**	**shop owners**	**building owners**	**property management**
Lighting signs of shops	Throughout the day	5.9	14.7	7.8	11.2
	After sunset till sunrise next day	17.4	15.1	17.4	29.1
Advertisement signs	Throughout the day	9.8	8.1	4.5	7.1
	After sunset till sunrise next day	28.9	23.7	34.8	42.4
Lighting for buildings/facades	Throughout the day	6	5.8	5.1	2.9
	After sunset till sunrise next day	37.3	27.2	43.0	55.9
Lighting of parks, etc.	Throughout the day	1.8	1.8	3.2	0.0
	After sunset till sunrise next day	45.5	16.4	54.8	44.4
Floodlight of sports fields etc.	Throughout the day	1.4	0.0	0.0	0.0
	After sunset till sunrise next day	11.5	16.9	0.0	100.0
Large video displays or Video walls	Throughout the day	13.3	20.6	33.3	33.3
	After sunset till sunrise next day	11.5	16.8	0.0	0.0
External lighting of the building	Throughout the day	--	--	4.0	2.0
	After sunset till sunrise next day	--	--	33.3	39.0

** Chi-square test 9*

9 *Chi-square test 9: The findings for residents,shop owners, building owners, property management, neighbours of sports and recreational facilities, "light sernsitive receivers – residents, workers" were significantly different at 0.01 significance level according to the resutls of chi-square test except "Floodlight of sports fields / swimming pools and External lighting of the building".*

3.13 For residents in the light sensitive groups, namely those who were living near areas with more external lighting, for obvious reasons, a higher proportion noted that lighting signs of shops (52%) and advertisement signs (50%) were turned on either throughout the day or from sunset until sunrise, as compared to residents in general as indicated in para. 3.12. The proportion for residents in the light sensitive groups was lower for light for buildings or facades (33%), lighting of parks (0%), flood light of sports fields, etc. (0%) and large video displays or video walls (0%), as compared with residents in general.

External lighting (%)		**Neighbours of Sports/Recreational Facilities**	**Light sensitive receivers**	
			Residents	**Workers**
Lighting signs of shops	Throughout the day	10.8	14.3	0
	After sunset till sunrise next day	24.3	38.1	15.4
Advertisement signs	Throughout the day	4.5	0	0
	After sunset till sunrise next day	18.2	50	11.1
Lighting for buildings/facades	Throughout the day	4.2	13.3	0
	After sunset till sunrise next day	25	20	33.3
Lighting of parks, etc.	Throughout the day	3.8	0	0
	After sunset till sunrise next day	7.7	0	0
Floodlight of sports fields/swimming pools	Throughout the day	0	0	0
	After sunset till sunrise next day	12	0	0
Large video displays/Video walls	Throughout the day	0	0	0
	After sunset till sunrise next day	9.1	0	0

** Chi-square test 9*

Features of external lighting

3.14 About 36% of residents indicated that there were features such as "shining into my building", "changing colour all the time", "flickering all the time" and "shining to the sky unnecessarily", which in the Consultant's view undesirable, for advertisement signs. The corresponding percentage for lighting for buildings or facades and lighting signs of shops was slightly lower, at 31% and 30% respectively. A much lower proportion of shop owners, building owners and property management shared such a view, reflecting a difference in views between those who were likely to be affected by such features of external lighting (namely residents) on the one hand,

and those who were likely to be responsible for generating these features of external lighting.

External lighting (%)		Residents	shop owners	building owners	property management
Lighting signs of shops	Have features	29.9	15.2	22.4	17.2
	No such feature	70.1	84.8	77.6	82.8
Advertisement signs	Have features	35.9	14.4	16.9	14.1
	No such feature	64.1	85.6	83.1	85.9
Lighting for buildings/facades	Have features	30.7	13.7	16.5	5.9
	No such feature	69.3	86.3	83.5	94.1
Lighting of parks, etc.	Have features	6.6	8.1	6.5	0.0
	No such feature	93.4	91.9	93.5	100.0
Floodlight of sports fields, etc.	Have features	6.9	16.4	50.0	0.0
	No such feature	93.1	83.4	50.0	100.0
Large video displays or video walls	Have feature	13.4	11.5	46.7	66.7
	No such feature	87.6	88.5	53.3	33.3
External lighting of the building	Having feature	--	--	10.7	8.0
	No such feature	--	--	89.3	92.0

** Chi-square test 10*

3.15 The percentage of residents who considered that there were undesirable features for lighting of parks, etc. (7%), floodlight of sports fields or swimming pools (7%) and large video displays or video walls (12%) was much lower. It may be of interest to note that a much higher proportion of building owners considered that there were undesirable features for floodlight of sports fields or swimming pools (50%) and large video displays or video walls (47%). The corresponding percentage for property management was also much higher in respect of large video displays or video walls (67%).

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10 *Chi-square test 10: The findings for residents,shop owners, building owners, property management, neighbours of sports and recreational facilities, "light semsitive receivers – residents, workers, drivers", tourists, users of sports/recreational facilities, shop-goers/customers were significantly different at 0.01 significance level according to the resutls of chi-square test except "External lighting of the building".*

3.16 As expected a higher proportion of those in the light sensitive groups considered that there were features such as "shining into my building", "changing colour all the time", "flickering all the time" and "shining to the sky unnecessarily" for advertisement signs, lighting signs of shops and lighting for buildings or facades. The corresponding proportions for users of sports or recreational facilities in respect of advertisement signs, lighting signs of shops, lighting for buildings or facades, lighting of parks, floodlight of sports fields and large video displays or video walls were also quite high.

External lighting (%)		**Neighbours of Sports/ Recreational Facilities**	**Light sensitive receivers**		
			Residents	**Workers**	**Drivers**
Lighting signs of shops	Have features	37.8	47.6	53.8	80.0
	No such feature	62.2	52.4	46.2	20.0
Advertisement signs	Have features	40.9	28.6	55.6	80.0
	No such feature	59.1	71.4	44.4	20.0
Lighting for buildings, etc.	Have features	29.2	26.7	33.3	46.7
	No such feature	70.8	73.3	66.7	53.3
Lighting of parks, etc.	Have features	38.5	0	0	8.3
	No such feature	61.5	100.0	100.0	91.7
Floodlight of sports fields, etc.	Have features	32.0	0	0	38.5
	No such feature	68.0	100.0	100.0	61.5
Large video displays/Video walls	Have features	45.5	88.9	0	40.0
	No such feature	54.5	11.1	100.0	60.0

* *Chi-square test 10*

3.17 In particular, more than half of tourists were also of views that there were features like "changing colour all the time", "flickering all the time" and "shining to the sky unnecessarily" for light signs of shops (62%), advertisement signs (59%) and large video displays or video walls (62%). The fact the percentage is higher than that for residents in general is probably because tourists are likely to be visiting areas with more external lighting.

External lighting (%)		Tourists	Users of sports/recreational Facilities	Shop-goers/Customers
Lighting signs of shops	Have features	62.3	67.7	30.3
	No such feature	37.7	32.3	69.7
Advertisement signs	Have features	58.5	58.6	33.7
	No such feature	41.5	41.4	66.3
Lighting for buildings/facades	Have features	48.6	6.1	31.7
	No such feature	51.4	93.9	68.3
Lighting of parks, etc.	Have features	31.2	3.6	15.8
	No such feature	68.8	96.4	84.2
Floodlight of sports fields, etc.	Have features	26.4	4.6	24.4
	No such feature	73.6	95.4	75.6
Large video displays/ video walls	Have features	61.5	50.0	44.0
	No such feature	38.5	50.0	56.0

* *Chi-square test 10*

Observations

3.18 Though stakeholders, including those who were likely to be affected by external lighting and those who were likely to be responsible for managing external lighting, shared similar views that there was light pollution in Hong Kong, it is of interest to note from the above discussions that there were differences among them on the extent of external lighting in Hong Kong. For residents in general, a higher proportion of them considered external lighting signs were many or too many, big or too big and bright or too bright, as compared with shop owners, building owners and property management. The corresponding percentage of those who were more affected by external lighting, including neighbours of sports and recreational facilities and light sensitive receivers, was even higher.

3.19 Furthermore, a higher proportion of those who were more likely to be affected by external lighting considered that external lighting signs were shining into others' buildings, changing colour all the time, flickering all the time and shining into the sky unnecessarily, as compared with those who were likely to be responsible for generating external lighting. These are features which the Consultant considers as

undesirable.

3.20 In particular, more than half of tourists were also of views that there were features like "changing colour all the time", "flickering all the time" and "shining to the sky unnecessarily" for light signs of shops, advertisement signs and large video displays or video walls.

3.21 In the circumstances, there is a need to close the gap in perception of whether external lighting signs were many or too many, big or too big, bright or too bright, shining into others' buildings, changing colour all the time, flickering all the time and shining into the sky unnecessarily, between those who were likely to be responsible for managing external lighting and those who were likely to be affected by external lighting. For instance, shop owners may continue to erect external lighting signs that they do not consider as too many, too big or too bright, while residents find such lighting signs too many, too big or too bright, or erecting external lighting signs that caused disturbances to residents living nearby.

3.22 It may be of interest to note that the views of residents, shop owners, building owners and property management were not very much different with regards to the time at which external lighting signs were turned on, including being turned on throughout the day or from sunset till sunrise, which in the Consultant's view were undesirable. Apparently, whether external lighting signs were too many, too big, too bright, changing colour too or flickering too much, or pointing in the wrong direction could be more subjective in nature, leading to differences in views between different stakeholders.

IV. Impact of external lighting

Adverse impact of external lighting

Impact on daily life or daily work

4.1 Only a small proportion of residents (7.4%) and shop owners (4.7%) considered the external lighting near their place of residence or place of work had adversely affected their daily life or daily work. On the other hand, the great majority of residents (91%) and shop owners (87%) considered that the impact of external lighting near their place of residence or place of work was insignificant.

Percentage who agreed with the statement	Shop owners	Residents
External lighting near my place of residence or work has adversely affected my daily life or work	4.7	7.4
The impact of external lighting near my place of residence or work on my daily life or work is insignificant	86.9	91.3

* *Chi-square test 11*

4.2 For workers whose place of work was in areas with more external lighting, only around 13% of them considered that external lighting near their place of residence or place of work had adversely affected their daily life. However, a much higher proportion of those who were living in areas with more external lighting (40%) and neighbours of sports and recreational facilities (30%) considered that external lighting near their place of residence or place of work had adversely affected their daily life. On the other hand, more than half of them considered that the impact of external lighting near their place of residence or place of work was insignificant.

11 *Chi-square test 11: The findings for residents, shop owners, neighbours of sports and recreational facilities, "light sernsitive receivers – residents, workers", were significantly different at 0.01 significance level according to the resutls of chi-square test.*

Percentage who agreed with the statement	Neighbours of Sports and Recreational Facilities	Light sensitive receivers	
		Residents	Workers
External lighting near my place of residence or work has adversely affected my daily life or work	30.0	40.0	13.4
The impact of external lighting near my place of residence or work on my daily life or work is insignificant	74.0	60.0	86.6

* *Chi-square test 11*

Impact on mental or physical health

4.3 Only a small proportion of residents in general (6%) or shop owners (5%) considered the external lighting near their place of residence or place of work had adversely affected their mental or physical health. On the other hand, the great majority of residents in general (92%) and shop owners (87%) considered that the impact of external lighting near their place of residence or place of work on their mental or physical health was insignificant.

Percentage who agreed with the statement	Shop owners	Residents
External lighting near my place of residence or shop has adversely affected my mental and physical health	4.5	6.0
The impact of external lighting near my place of residence or shop on my mental and physical health is insignificant	87.4	91.5

* *Chi-square test 12*

4.4 However, for the light sensitive receivers and neighbours of sports and recreational facilities, a much higher proportion of them considered that external lighting near their place of residence or place of work had adversely affected their mental or physical health. On the other hand, more than half of them considered that the impact of external lighting near their place of residence or place of work on their

12 *Chi-square test 12: The findings for residents, shop owners, neighbours of sports and recreational facilities, "light sernsitive receivers – residents, workers", were significantly different at 0.01 significance level according to the resutls of chi-square test.*

mental or physical health was insignificant.

Percentage who agreed with the statement	Neighbours of Sports and Recreational Facilities	Light sensitive receivers	
		Residents	Workers
External lighting near my place of residence or shop has adversely affected my mental and physical health	18.0	36.0	20.0
The impact of external lighting near my place of residence or shop on my mental and physical health is insignificant	66.0	64.0	79.9

* *Chi-square test 12*

Effect of external lighting on Hong Kong in general

4.5 More than half of those who were likely to be affected by external lighting as well as those who were likely to be responsible for managing external lighting had a positive view on the effect of external lighting on Hong Kong in general. For example, 78% of residents in general considered that external lighting helped beautify the environment, boost Hong Kong's image as "dynamic metropolis" and promote tourism and 87% considered that external lighting helped provide a safe environment and reduce crime by lighting up streets at night. The corresponding percentage for shop owners, building owners and property management were at similar levels.

4.6 However, 76% of residents were of the view that external lighting in Hong Kong was too excessive to the extent of causing nuisance and wasting energy unnecessarily. In other words, while most recognized the benefits of external lighting to Hong Kong in general, they considered that external lighting were currently too excessive.

% who agreed with the statement	Residents	Shop owners	Building owners	Property management
External lighting IN HONG KONG helps beautify the environment, boost Hong Kong's image as a "dynamic metropolis" and promote tourism	78.2	82.6	84.0	81.1
External lighting IN HONG KONG helps provide a safe environment and reduce crime by lighting up the streets at night	87.3	83.0	83.4	86.0
External lighting IN HONG KONG is too excessive to the extent of wasting energy unnecessarily and creating nuisance	75.6	64.5	67.5	72.6

** Chi-square test 13*

4.7 It may be of interest to note that for residents living near areas with more external lighting, a higher proportion of them, as compared with residents in general, agreed with the beneficial impact of external lighting on Hong Kong, with 88% of them considered that external lighting helped beautify the environment, boost Hong Kong's image as "dynamic metropolis" and promote tourism and 96% considered that external lighting helped provide a safe environment and reduce crime by lighting up streets at night. Workers and drivers in the light sensitive groups also shared similar views.

4.8 Those who were more affected by external lighting, including neighbours of sports and recreational facilities and light sensitive receivers were also of the view that external lighting in Hong Kong was too excessive to the extent of causing nuisance and wasting energy unnecessarily. In short, while those who were more affected by external lighting recognized the benefits of external lighting to Hong Kong in general, they considered that external lighting was currently too excessive.

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13 *Chi-square test 13: The findings for residents,shop owners, building owners, property management, neighbours of sports and recreational facilities, "light semsitive receivers – residents, workers, drivers, astronomical observers", tourists, customers, users of sports/recreational facilities, interest groups, etc. were significantly different at 0.01 significance level according to the resutls of chi-square test.*

% who agreed with the statement	Neighbours of Sports and Recreational Facilities	Light sensitive receivers			
		Residents	Workers	Drivers	Astronomical observers
External lighting IN HONG KONG helps beautify the environment, boost Hong Kong's image as a "dynamic metropolis" and promote tourism	66.0	88.0	80.0	92.46	60.0
External lighting IN HONG KONG helps provide a safe environment and reduce crime by lighting up the streets at night	64.0	96.0	86.6	92.4	60.0
External lighting IN HONG KONG is too excessive to the extent of creating nuisance and wasting energy unnecessarily	78.0	76.0	86.7	76.9	90.0

** Chi-square test 13*

4.9 Tourists had a much more positive view of external lighting with the great majority of them having the view that external lighting helped beautify the environment, boost Hong Kong's image as "dynamic metropolis" and promote tourism, and that external lighting helped provide a safe environment and reduce crime by lighting up streets at night. More than half of customers, users of sports and recreational facilities, interest groups, professional institutions and trade associations also shared similar views.

4.10 It may be worth noting that compared with residents, shop owners, building owners, property management, neighbours of sports and recreational facilities, light sensitive groups, interest groups, professional institutions and trade associations, a much lower proportion of tourists (26%), customers (25%) and users of sports and recreational facilities (15%), who would use the external lighting for their activities, considered external lighting in Hong Kong was too excessive to the extent of wasting energy unnecessarily and causing nuisance.

% who agreed with the statement	Tourists	Customers	Users of sports and Recreational Facilities	Interest groups, etc.
External lighting IN HONG KONG helps beautify the environment, boost Hong Kong's image as a "dynamic metropolis" and promote tourism	92.6	64.2	73.0	73.3
External lighting IN HONG KONG helps provide a safe environment and reduce crime by lighting up the streets at night	91.1	69.9	73.7	63.3
External lighting IN HONG KONG is too excessive to the extent of creating nuisance and wasting energy unnecessarily	26.2	25.2	14.9	83.3

** Chi-square test 13*

Observations

4.11 While 75% of residents and 72% of shop owners in Hong Kong considered there was light pollution in Hong Kong, only 7% of residents and 5% of shop owners indicated that external lighting near their place of residence or work had adversely affected their daily life or work. Furthermore, only 6% of residents and 5% of shop owners indicated that external lighting near their place of residence or work had adversely affected their mental or physical health. Apparently, external lighting had a significant, adverse impact on only a small proportion of residents and shop owners in Hong Kong.

4.12 For those who were more affected by external lighting, a higher proportion of them considered that external lighting had adversely affected their daily life or work, mental physical health. For residents living near areas with intense external lighting, in particular, as high as 36% indicated that external lighting had adversely affected their daily life; but 60% of them indicated that the impact of external lighting on their mental or physical health is insignificant. It follows that it is desirable that remedial actions should be taken with regards to areas where there is intensive external lighting.

4.13 As regards benefits of external lighting, most stakeholders interviewed in the

study, including those who were likely to be affected by external lighting and those who were likely to be responsible for managing external lighting, shared similar views. Most of them considered that external lighting helped beautify the environment, boost Hong Kong's image as "dynamic metropolis" and promote tourism. Most of them were also of the view that external lighting helped provide a safe environment and reduce crime by lighting up streets at night.

4.14 On the other hand, with the exception of tourists, customers and users of sports and recreational facilities, most stakeholders interviewed in the study considered that external lighting was too excessive to the extent of creating nuisance and wasting energy unnecessarily. Apparently, there is a need to ensure that external lighting is not too excessive without diminishing its beneficial impact on Hong Kong.

V. Improvement measures

Effectiveness of measures targeting excessive external lighting

5.1 In the survey, views of stakeholders were sought on the effectiveness of measures to reduce the possible impact of external lighting. For stakeholders who were likely to be responsible for managing external lighting, most of them considered "reduce the number of lighting", "reduce the size of lighting signs", "reduce the brightness of lighting", "lighting to be turned on only at night", "lighting to be turned off after midnight", "avoid the use of lighting or signs that flicker or change in colours" and "adjust the angle of lighting so that the light would not shine into residents' flat" effective in reducing the impact of external lighting.

5.2 More specifically, a higher proportion of shop owners considered "lighting to be turned off after midnight" and "lighting to be turned on only at night" effective. For building owners, property management and relevant associations of shop owners, building owners and property management, a higher proportion of them considered "lighting to be turned off after midnight", "avoid the use of lighting or signs that flicker or change in colours" and "adjust the angle of lighting so that the light would not shine into residents' flat" effective.

% who considered the measure effective	Shop owners	Building owners	Property management	Relevant associations
Reduce the number of lighting	76.3	78.6	82.1	90.9
Reduce the size of lighting signs	72.8	82.9	76.7	90.5
Reduce the brightness of lighting	78.9	79.5	75.9	90.9
Lighting to be turned on only at night	83.6	80.2	86.6	90.9
Lighting to be turned off after midnight	85.4	87.2	90.5	95.5
Avoid the use of lighting/signs that flicker or change in colours	80.3	85.9	90.5	95.5
Adjust the angle of lighting so that the light would not shine into residents flats	80.1	88.6	94.8	95.5

** Chi-square test 14*

14 *Chi-square test 14: The findings for shop owners, building owners, property management, relevant associations, residents, neighbours of sports and recreational facilities, "light sensitive*

5.3 Similarly, most residents in general considered the various measures mentioned above effective. However, for residents whose place of residence and workers whose place of work were in areas with intensive external lighting, a lower proportion of them considered these measures effective. In particular, less than half of residents living in areas with intensive external lighting considered "lighting to be turned off after midnight" and "lighting to be turned on only at night" effective. On the other hand, a relatively higher proportion of those in the light sensitive groups, including residents, workers and drivers, considered reducing the number, size and brightness of external lighting signs effective.

Effective (%)	**Residents**	**Neighbours of Sports and Recreational Facilities**	**Light sensitive receivers**		
			Residents	**Workers**	**Drivers**
Reduce the number of lighting	82.8	81.3	80.0	80.0	95.7
Reduce the size of lighting signs	83.8	85.4	80.0	80.0	91.3
Reduce the brightness of lighting	90.4	80.9	76.0	86.7	69.6
Lighting to be turned on only at night	90.7	83.3	48.0	66.7	56.5
Lighting to be turned off after midnight	83.4	93.8	45.8	66.7	69.6
Avoid the use of lighting/signs that flicker or change in colours	90.1	76.1	50.0	38.5	65.2
Adjust the angle of lighting so that the light would not shine into residents' flats	89.4	58.3	56.0	66.7	69.6

** Chi-square test 14*

5.4 Similarly, for tourists, customers, users of sports and recreational facilities as well as interest groups, professional institutions and other trade associations, most of them also considered the various measures effective. It may be worth noting that a higher proportion of customers, interest groups, professional institutions and other

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receivers – residents, workers, drivers", tourists, customers, users of sports/recreational facilities, interest groups, etc. were significantly different at 0.01 significance level according to the resutls of chi-square test except "Reduce the number of lighting".

trade associations considered "lighting to be turned off after midnight" effective.

Effective (%)	Tourists	Users of sports and Recreational Facilities	Customers	Interest groups, etc.
Reduce the number of lighting	78.5	77.9	81.3	63.3
Reduce the size of lighting signs	82.4	80.2	78.6	53.3
Reduce the brightness of lighting	82.3	81.2	82.8	70.0
Lighting to be turned on only at night	76.6	91.1	75.2	73.7
Lighting to be turned off after midnight	68.6	85.1	84.5	76.7
Avoid the use of lighting/signs that flicker or change in colours	78.8	88.5	74.6	63.3
Adjust the angle of lighting so that the light would not shine into residents' flats	87.1	89.2	80.2	73.3

* *Chi-square test 14*

Publicity and education

5.5 As regards publicity and educational measures, for stakeholders who were likely to be responsible for managing external lighting, most of them considered measures targeted at owners of lighting such as "promote sense of social responsibility to owners of lighting so that they will take action to minimize adverse impact of external lighting on residents", "promote energy conservation so that owners of lighting will take actions to keep external lighting to a minimum" and "promote the need to preserve the natural treasure of the starry night sky so that owners of lighting will take action to minimize impact of external lighting on the sky" effective, though a lower proportion of shop owners considered measure related to the need to preserve natural treasure of the starry night effective. Educating members of the public on the adverse impact of external lighting was also considered effective by most stakeholders.

% who considered effective	Shop owners	Building owners	Property management	Relevant associations
Promote sense of social responsibility to owners of lighting so that they will take action to minimize adverse impact of	72.3	88.2	90.0	95.5

external lighting on people				
Promote energy conservation so that owners of lighting will take actions to keep external lighting to a minimum	81.8	92.3	90.4	95.5
Promote the need to preserve the natural treasure of the starry night sky so that owners of lighting will take action to minimize impact of external lighting on the sky	65.4	91.8	89.7	90.0
Educate public on the adverse impact of external lighting	78.4	85.4	85.6	100.0

** Chi-square test 15*

5.6 Similarly, most residents in general considered the various publicity and education measures mentioned above effective. However, for neighbours of sports and recreational facilities, and residents whose place of residence and workers whose place of work were in areas with intensive external lighting, less than half of them considered publicity measures targeted at owners of lighting effective, though more than half of them considered educating members of the public on the adverse impact of external lighting effective.

% who considered effective	**Residents**	**Neighbours of Sports and Recreational Facilities**	**Light sensitive receivers**		
			Residents	**Workers**	**Drivers**
Promote sense of social responsibility to owners of lighting so that they will take action to minimize adverse impact of external lighting on people	76.6	39.6	20.0	26.7	56.5
Promote energy conservation so that owners of lighting will take	77.8	39.6	28.0	40.0	52.2

15 *Chi-square test 15: The findings for shop owners, building owners, property management, relevant associations, residents, neighbours of sports and recreational facilities, "light sernsitive receivers – residents, workers, drivers", tourists, customers, users of sports/recreational facilities, interest groups, etc. were significantly different at 0.01 significance level according to the resutls of chi-square test.*

actions to keep external lighting to a minimum					
Promote the need to preserve the natural treasure of the starry night sky so that owners of lighting will take action to minimize impact of external lighting on the sky	72.9	43.8	36.0	33.3	56.5
Educate public on the adverse impact of external lighting	83.3	59.2	64.0	53.3	65.2

* *Chi-square test 15*

5.7 Most tourists, customers, users of sports and recreational facilities as well as interest groups, professional institutions and other trade associations shared similar views. They also considered the various publicity and educational measures effective.

% who considered effective	**Tourists**	**Users of sports and Recreational Facilities**	**Customers**	**Interest groups, etc.**
Promote sense of social responsibility to owners of lighting so that they will take action to minimize adverse impact of external lighting on people	78.9	81.9	61.2	86.2
Promote energy conservation so that owners of lighting will take actions to keep external lighting to a minimum	80.1	92.7	73.0	86.2
Promote the need to preserve the natural treasure of the starry night sky so that owners of lighting will take action to minimize impact of external lighting on the sky	80.3	79.4	56.8	82.1
Educate public on the adverse impact of external lighting	82.4	87.0	74.4	89.7

* *Chi-square test 15*

Self-regulation

5.8 In the survey, views of respondents were sought on the effectiveness of self-regulation measures to protect Hong Kong residents from the adverse impact of external lighting. For stakeholders who were likely to be responsible for managing external lighting, most of them considered measures such as "self-regulation by business community to minimize the impact of external lighting on residents" and "self-regulation by professional or trade association involved in the installation of external lighting" effective.

% who considered effective	Shop owners	Building owners	Property management	Relevant associations
Self-regulation by business community to minimize the impact of external lighting on people	63.7	67.4	68.9	77.3
Self-regulation by professional or trade association involved in the installation of external lighting	57.7	68.5	67.3	72.7

* *Chi-square test 16*

5.9 For residents in general, more than half of them also considered self-regulation measures effective. However, for those more affected by external lighting, including neighbours of sports and recreational facilities and light sensitive receivers, a much lower proportion of them considered these self-regulation measures effective. In particular, only 22% to 28% of residents, workers and drivers belonging to the light sensitive groups considered such self-regulation measures effective.

16 *Chi-square test 16: The findings for shop owners, building owners, property management, relevant associations, residents, neighbours of sports and recreational facilities, "light sensitive receivers – residents, workers, drivers, astronomical observers", tourists, customers, users of sports/recreational facilities, interest groups, etc. were significantly different at 0.01 significance level according to the resutls of chi-square test.*

% who considered effective	Residents	Neighbours of Sports and Recreational Facilities	Light sensitive receivers			
			Residents	Workers	Drivers	Astronomical observers
Self-regulation by business community to minimize the impact of external lighting on people	69.1	38.8	48.0	53.3	41.7	60.0
Self-regulation by professional or trade association involved in the installation of external lighting	64.5	58.3	28.0	26.7	21.7	50.0

** Chi-square test 16*

5.10 Most tourists, customers, users of sports and recreational facilities as well as interest groups, professional institutions and other trade associations also considered the various publicity and educational measures effective, though a lower proportion of customers considered such measures effective.

% who considered effective	Tourists	Users of sports and Recreational Facilities	Customers	Interest groups, etc.
Self-regulation by business community to minimize the impact of external lighting on people	78.0	71.8	56.6	76.7
Self-regulation by professional or trade association involved in the installation of external lighting	79.0	66.9	55.5	60.0

** Chi-square test 16*

Actions by Government

5.11 Most stakeholders (60% to 89%) who were likely to be responsible for managing external lighting, most of them considered actions by Government, including "taking action upon receipt of complaints from people affected", "issuing guidelines on external lighting", "enacting legislations to control the installation and

use of external lighting" effective.

% who considered effective	Shop owners	Building owners	Property management	Relevant associations
Government department to take action upon receipt of complaints from people affected	83.0	82.1	80.8	72.7
Government to issue guidelines on external lighting	82.6	83.1	84.8	81.8
Government to legislate to control the installation and use of external lighting	84.9	86.0	88.8	60.0

** Chi-square test 17*

5.12 For those who were more likely to be affected by external lighting, including residents in general, neighbours of sports and recreational facilities and the light sensitive receivers, most of them also considered actions by Government effective. It may be worth noting that the proportion of residents in general, neighbours of sports and recreational facilities, residents whose place of residence and workers whose place of work were in areas with intensive external lighting who considered legislations effective was higher than the corresponding proportion for the two other actions by Government.

% who considered effective	Residents	Neighbours of Sports and Recreational Facilities	Light sensitive receivers			
			Residents	Workers	Drivers	Astronomical observers
Government department to take action upon receipt of complaints from people affected	89.3	75.5	72.0	73.3	72.7	100.0
Government to issue guidelines on external	87.4	79.6	68.0	64.3	91.7	100.0

17 *Chi-square test 17: The findings for shop owners, building owners, property management, relevant associations, residents, neighbours of sports and recreational facilities, "light sensitive receivers – residents, workers, drivers, astronomical observers", tourists, customers, users of sports/recreational facilities, interest groups, etc. were significantly different at 0.01 significance level according to the resutls of chi-square test except "Government to issue guidelines on external lighting".*

lighting						
Government to legislate to control the installation and use of external lighting	92.2	81.3	80.0	86.7	82.6	100.0

** Chi-square test 17*

5.13 Most tourists, customers, users of sports and recreational facilities as well as interest groups, professional institutions and other trade associations also considered the actions by Government effective. In particular, a higher proportion of them considered enacting legislations to control the installation and use of external lighting effective.

% who considered effective	**Tourists**	**Users of sports and Recreational Facilities**	**Customers**	**Interest groups, etc.**
Government department to take action upon receipt of complaints from people affected	88.0	85.8	85.9	80.0
Government to issue guidelines on external lighting	84.3	83.8	87.9	73.3
Government to legislate to control the installation and use of external lighting	90.3	93.4	93.6	92.6

** Chi-square test 17*

Observations

5.14 The above discussions show that those who were likely to be responsible for managing external lighting considered various measures directed at the sources of external lighting effective in reducing the impact of external lighting. The percentage sharing such a view was higher for measures on restricting the time at which external lighting should be turned on, avoiding the use of lighting signs that flicker or change colours and adjusting the angle of lighting so that lighting would not shine into residents' flats.

5.15 Presumably, shop owners, building owners, property management and relevant trade associations considered these measures were easier to be implemented as compared with measures aimed at reducing the number, size and brightness of external lighting signs which were likely to be more subjective in nature, especially in view of the differences, as discussed in Chapter III, between perception of the extent

of external lighting between those who were likely to be affected by external lighting and those who were likely to be responsible for managing external lighting.

5.16 While most residents in general also shared similar views as shop owners, building owners, property management and related trade, it may be of interest to note that only about half of the residents whose place of residence was in areas with more external lighting agreed that such measures as restricting the time at which external lighting should be turned on, avoiding the use of lighting signs that flickered or changed colours and adjusting the angle of lighting so that lighting would not shine into residents' flats were effective in reducing the impact of external lighting. On the other hand, 76% to 80% of these residents considered reducing the number, size and brightness of external lighting signs would be effective. Admittedly, those living in areas with more external lighting signs were more affected by external light signs which they considered too many, too large and too bright. As a result, turning off external lighting signs after midnight, for instance, would not help much in reducing the impact of external lighting on them before midnight.

5.17 It may also be of interest to note that while most stakeholders that were likely to be responsible for managing external lighting, residents in general, drivers, tourists, customers, interest groups, professional institutions and trade associations were of the view that education and publicity, and self-regulation were effective in reducing the impact of external lighting, less than half of residents whose place of residence were in areas with more external lighting considered such measures effective. Instead, most of these residents considered actions by Government effective. In other words, from the perspectives of those who were more affected by external lighting, actions by Government were the preferred approach in reducing the impact of external lighting.

VI. Recommendations

6.1 The present study examines the views of stakeholders and members of the public from the perspectives of those who are likely to be affected by external lighting and those who are likely to be responsible for managing external lighting, as well as those who may have some utility from the external lighting (e.g. customers and visitors who were new to Hong Kong and interest groups and organizations that had an interest in the subject matter. By comparing and contrasting their perception of external lighting and its impact, and by soliciting their views on the effectiveness of different measures in addressing the concerns of stakeholders, the Consultant has come up with a number of recommendations which are discussed in the paragraphs to follow.

External lighting: an area of public concern

6.2 What is immediately apparent from the survey findings is that there is a high level of awareness of external lighting existing in areas near people's place of residence, work or operations, among members of the public and relevant stakeholders, regardless of whether or not they are affected by external lighting. In addition, most of them are aware of people's complaints about light pollution. They are also of the view that there is light pollution in Hong Kong.

6.3 Given the high level of public awareness, *it is recommended that the Government consider drawing up and implementing measures to address any possible nuisance arising from external lighting in Hong Kong.*

6.4 Despite the high level of awareness of external lighting, it is of interest to note that only a very small proportion of those affected by external lighting has lodged complaints with relevant government departments. The main reason for not lodging any complaint was that they did not think lodging a complaint would help. It is noted that while there are channels for complaints against noise pollution, there is apparently no proper channel for complaints against light pollution.

6.5 The Consultant is of the view that this sense of "helplessness" has to be addressed in dealing with nuisance caused by external lighting. Artificial light is inevitable in a modern society and increased use of artificial light as external lighting is almost synonymous with development. However, improper or excessive use of

external lighting could cause a nuisance to others who in turn should have a right to redress. In the UK, for instance, civil actions may be taken by individuals affected by external lighting, if he or she can prove that a nuisance exists.

6.6 It is recommended that the Government should consider setting up a one-stop mechanism for dealing with complaints from those affected by external lighting and mediate between owners of external lighting and those affected to minimize, if not eliminate, any nuisance caused by external lighting.

Fighting light pollution: a targeted and balanced approach

6.7 The Consultant notes that while most stakeholders believe that there is light pollution in Hong Kong, only a small proportion of them consider external lighting has adversely affected their daily life or daily work, mental or physical health. On the contrary, most of them had positive views of external lighting, in helping to beautify the environment, boost Hong Kong's image as "dynamic metropolis", promote tourism and provide a safe environment and reduce crime by lighting up streets at night.

6.8 On the other hand, for those who are more affected by external lighting, say residents living near areas with more external lighting, as high as 36% indicated that external lighting had adversely affected their daily life; but 60% of them also indicated that the impact of external lighting on their mental or physical health is insignificant. In other words, though external light has little adverse impact on stakeholders in general, its impact is much more significant in areas where there is intensive external lighting. It follows that a targeted approach in tackling light pollution is likely to be more effective, targeting those areas that are more affected by external lighting whilst preserving the benefits external light has on Hong Kong in general.

6.9 Furthermore, the study findings show that there is diversity of views between those who are responsible for managing external lighting (e.g. shop owners) and those who are affected by external lighting (e.g. residents). External lighting signs perceived by residents as too many, too big or too bright may not be so from the eyes of shop owners. The fact that there are many shops erecting external lighting signs would result in having too many lighting signs in a particular locality. Besides, given that buildings are physically very close to one another and that the residential units

situated in commercial or shopping areas, it may be practically difficult to avoid external lighting signs having an adverse impact on residents in the areas. It is noted that any regulating measures on lighting would result in an increase in the cost of doing businesses, threatening the livelihood of workers in the trades and indirectly increase the costs of goods and services of businesses that relied on external lighting in attracting customers.

6.10 In the circumstances, a delicate balance has to be struck in protecting residents and other stakeholders (e.g. drivers) from nuisances caused by external lighting on the one hand and preserving the benefits of external lighting signs to Hong Kong in general, taking due consideration of the interests of shop owners and workers etc. whose livelihood is closely related external lighting.

6.11 To sum up from the above discussions, *it is recommended that any measures designed to reduce the impact of external lighting should be both targeted, focusing on areas where there is intensive external lighting, as well as balanced, taking into account the interests of all parties concerned.*

Education and promotion: a win-win approach

6.12 The survey findings reveal striking similarities in views between those who are affected by external lighting and those who are responsible for managing external lighting. Both groups of stakeholders were aware that there was light pollution in Hong Kong. They were also of the view that external lighting in Hong Kong was too excessive to the extent of wasting energy unnecessarily and causing nuisance.

6.13 Besides, all stakeholders concerned agreed that measures such as promoting sense of social responsibility to owners of lighting so that they would take action to minimize adverse impact of external lighting on residents, promoting energy conservation so that owners of lighting will take actions to keep external lighting to a minimum and educating members of the public on the adverse impact of external lighting effective in reducing the impact of external lighting. Education and publicity measures on corporate social responsibility and energy conservation should serve the interests of those responsible for managing external lighting. Indeed, good corporate responsibility helps businesses in promoting their image and enhance customers' acceptance of their goods and services. Energy conservation is part and parcel of "low carbon economy", bringing benefits to all stakeholders, both at present and in the

future.

6.14 It is recommended that education and publicity measures should be mounted against the excessive use of external lighting, as part of Government's drive to promote corporate social responsibility and "low carbon economy".

6.15 With proper choice of types of lamps, positioning of lighting sources and use of shields and shading materials, taking into account physical environment of light sources, sufficient illumination could be achieved with minimum nuisance and maximum energy efficiency. In other words, it may not be necessary to have many, big and bright external lighting in order to beautify the environment, boost Hong Kong's image as a dynamic metropolis, promote tourism, attract customers and provide a safe environment by adequately lighting up the streets. In short, adequately trained workers and professional expertise and technology should be brought to bear in ensuring that external lighting signs are properly installed.

6.16 *It is recommended that consideration be given to provide training to people engaged in the installation of external lighting on the design and installation of external lighting, by involving workers' and employees' associations, professional institutions and training bodies.*

6.17 Through suitable publicity and promotion activities on good external lighting signs and giving due recognition to businesses installing good external lighting signs, it is believed employers and workers in the external lighting industry as well as businesses will have the incentive to invest in training and the development of good lighting signs, moving away from the current unhealthy practices of installing more, larger and brighter external lighting signs.

6.18 It is recommended that suitable publicity and promotion activities could be considered for launch to promote the installation of glare-free and energy efficiency lighting signs by businesses.

Meeting public expectation through a multi-pronged approach

6.19 Notwithstanding the fact that most stakeholders were of the view that education and promotion measures effective in reducing the impact of external lighting, the study also reveals that most stakeholders also considered actions by

Government effective. For residents who were more affected by external lighting, while less than half of them considered self-regulation effective, most of them considered actions by Government effective. In short, public expectation is high for Government to take action in reducing the impact of external lighting.

6.20 Members of the public and most stakeholders were not single-mindedly advocating the enactment of legislation by Government to control the installation and use of external lighting. Most of them also considered taking action upon receipt of complaints from people affected and issuing guidelines on external lighting effective. In other words, a multi-pronged approach was favoured.

6.21 It is recommended that Government should adopt a multi-pronged approach in reducing the impact of external lighting, by taking action upon receipt of complaints from people affected, issuing voluntary, good practices guidelines on external lighting and in the due course exploring the enactment of legislation to control the installation and use of external lighting.

6.22 While it was easier to control the timing at which external lighting should be turned on, the use of lighting signs that flicker or change colours and to adjust the angle of lighting so that the light would not shine into residents' flats, it may be more difficult to determine whether lighting signs are too many, too big or too bright. For instance, controlling luminance at the source of lighting is different from controlling illumination on objects receiving lighting. Much depends on the physical environment of areas affected external lighting, and the same lighting source may have different impact under different environment.

6.23 The Consultant believes that if consideration is given to enacting legislation, due considerations should be given to the enforcement aspects and regulatory burden on businesses. It is noted that the emerging trend in developed countries is a reduction and not an increase in regulatory burden and it is the way to go for Hong Kong in order to remain competitive. Furthermore, as discussed above, it is desirable to adopt a targeted and balanced approach in reducing the impact of external lighting.

6.24 *In the circumstances, it is recommended to keep under review the effectiveness of the measures in reducing the adverse impacts of external lighting and the need for other forms of regulatory measures, taking into account the benefits and impacts of external lighting, need to have targeted and balanced approach and the interests of all parties concerned and regulatory burden on businesses and the*

community at large.