

Appraisal of Determinants in Property Maintenance

CHAN KH, Hong Kong SAR, China

Key words : Dilapidated buildings, maintenance knowledge, safety, legislation, budget.

ABSTRACT

As one of the most densely populated cities, Hong Kong has been encompassed with many aged and dilapidated buildings leading to great safety concerns. Though there have been substantial discussions to enforce better control in building maintenance; it appears that most owners, if not all, have taken an apathetic attitude. In consequence, serious accidents happened e.g. collapse of the entire building and canopy; which caused deaths and severe injuries in the past. In this research, we'll aim to investigate the possible reasons, constraints and solutions to mitigate such maintenance problems so as to enhance better safety. The study will also explore the impacts of cost, legislation, owners' knowledge/attitude, government assistance, budget etc. towards the execution of maintenance by owners as a whole. Quantitative approach by means of structured questionnaire to randomly selected respondents will be adopted; followed by statistical analysis to ascertain the reliability, significance and correlation among various variables. It is expected to shed some lights in the way forward for better property maintenance in Hong Kong.

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1. INTRODUCTION

Hong Kong is a special administrative region of the People's Republic of China. Situated on China's south coast and enclosed by the Pearl River Delta and South China Sea, it is renowned for its expansive skyline and deep natural harbour. With land mass of 1,104 km² (426 sq mi) and a population of seven million people, Hong Kong is one of the most densely populated areas in the world (Wikipedia, 2009).

The HKISD (2009) reports that 29.1% population is living public rental housing, 17.9% in subsidized sale flat, 52.4% in private permanent housing, and 0.5 % in temporary housing estates. Over 70.3 % population bear the responsibility to manage/maintain their own properties.

In accordance with HKRVD (2009), private domestic units have risen to 1085900. Completions in 2009 and 2010 were expected to rise to 14740 units and 12600 units respectively based on the estimation at the end of 2008. In 2009, about 76% of the new supply comes from the New Territories and 15% from Kowloon. In 2010, the New Territories still accounts for 64% of the estimated new supply, with Yuen Long and Tseung Kwan O altogether providing about 45% of the completions (HKRVD, 2009).

Some decades ago, few buildings have its own Deeds of Mutual Covenant governing the rights and interests among individual owners; and providing the ground rules for the management/maintenance of a multi-owned/occupied building. There is no legislation governing the management of multi-storey buildings until 1970 when the Multi-storey Buildings (Owners Incorporation) Ordinance (now called Building Management Ordinance) is enacted. As long as one can keep the bare minimum functions of a building without great hazards, it suffices. Even not so well maintained building would have a market.

Further to the balcony collapse in Bowing Street in Yau Ma Tei in 1993, Government engages a consultant to investigate building management/maintenance problems, especially for aged buildings. The Study is of two phases i.e. Phase I - 4308 buildings constructed during 1946-1958; and Phase II - 25,000 buildings constructed during 1959 - 1980. It was identified

that these buildings have no proper building management nor regular maintenance; whilst the majority have no owner's corporation (OC) nor mutual aid committee (MAC).

Incidentally, tragic accidents due to building failures occur sometimes in Hong Kong. On 17 August 1990, a large concrete canopy fell off Shanghai Street and killed a passing woman. The canopy was found that no maintenance was ever done in the past 30 years. A 25 meters long reinforced concrete canopy built at 1/F of Wearbest Building in Tokwawan, fell onto a busy street and killed 6 passing people, with 7 heavily injured. The canopy was subsequently found to be an unauthorized building work/illegal structure. Likewise, on 15 November 1995, another reinforced concrete canopy of 10m x 2m collapsed in Yan Oi Court, Kwun Tong, resulting in one man died and two persons injured. In fact, the canopy was a cantilevered structure without proper maintenance. In Nov. 1998, the canopy at 4187 Kwun Tong Road (WKK Factory Building) and 1/F Balcony at No. 1P Marble Road, North Point, HK collapsed. These accidents did not happen by chance, but principally related to poor management and maintenance.

2. LITERATURE REVIEW

There appear limited researches conducted on the attitude of public towards building management and maintenance; while some research is focused on technical/safety issues. Maintenance decisions are based on expediency and over a period of time represent a series of ad hoc and unrelated compromises between the immediate physical needs of the building and the availability of finance (Lee, 2003).

Fundamentally, building maintenance is to preserve a building in its initial state, as far as practicable, so that it effectively serves its purpose. Anderson (1969) deplores the main purposes of building maintenance as (1) retaining value of investment; (2) maintaining the building in a condition in which it continues to fulfill its function; and (3) presenting a good appearance.

In addition, BSI (1994) divides maintenance into two broad categories, "unplanned" and "planned". Remedial action will not be taken until the defect is noted. However, on some occasions, it may be too late to do the rectification work since the building defects have posed actual dangers to the occupants or even to the public.

With regard to the building maintenance that we need to carry out day to day, Harper (1968) divides into three components, namely servicing, rectification and replacement. Servicing is essentially a cleaning operation which is undertaken regularly. Replacement is inevitable because service conditions cause materials to decay at different rates. Much replacement work stems not so much from the physical breakdown of the materials or element as from deterioration of appearance. Hence the length of acceptable life often involves a subjective judgment of aesthetics of change. The roots of poor maintenance are owners' apathy attitude, lack of building management/maintenance knowledge, aloof consumer participation. Small defects not rectified in time would eventually result in compounded expenses in future (Lee, 1990).

Nunn (2004) defines "Awareness" as a synonym for 'consciousness' or the state of being aware which is available to introspection, and the knowledge/realization of something. KCDB (2002) reveals that 66.9% buildings in Kwai Chung district have no residents-related committees to take care the building management/maintenance. About 66% residents have never attended any meetings convened by their owners' corporations/management companies. Moreover, about 74.3% residents have never complained on building management/maintenance matters even defects are identified.

From the studies, it only illustrate some primary problems, without addressing to resolve fully the ignorance and apathetic attitude of the public on building management/maintenance. This renders a gap to study. 84% compliance for statutory orders and 11% for advisory letters on average during 2004-2009 are reported in BA's "Monthly Digest, Nov. 2009". It reflects that the public are not so cautious about advisory letters, due to its advisory nature; while adopt a more positive attitude towards statutory orders.

Cap 123 Buildings Ordinance (BO) and Cap 344 Building Management Ordinance (BMO) are the major legislation regarding building management/maintenance in Hong Kong. It has been said that the more stringent the legislation, the higher the degree of compliance by owners. Under BO Section 26, BA may by order in writing require the building owners to carry out necessary repairs on their building which have been rendered dangerous or liable to become dangerous by whatever reasons. If it is found in a dilapidated condition and beyond repairs, appropriate closure and even demolition orders will be issued.

BA may prosecute the responsible owner with fine and imprisonment, if the owner is

convicted of guilty. BA would conduct a preliminary inspection for identification of suspicious buildings first before issuing Investigation Orders to relevant owners for rectification. As government resources would be quite limited, it may not be possible to conduct inspection to all problematic buildings in one go. Sometimes, it may be too late to do the repair works while accidents would inevitably happen.

BO Section 40 itself cannot force owners to comply with the captioned Ordinance. In case of default, Government's usual practice is to firstly carry out the repair works and try to recover the cost incurred from the related owner. That may hinder owners' initiative to rectify promptly any defects.

In reality, owners may not be fully conversant with the legislation regarding building management/maintenance. The legislation is considered not comprehensive enough. There are still some deficiencies that need improvement. Yet, ignorance of law is of no excuse. To fill the gap, perhaps Government may launch more campaigns/promotion to educate the public.

Under the existing legislation, no controlling provisions are made for demanding owners to take initiative for regular building maintenance in Hong Kong. They are of rectifying approach rather than preventive approach i.e. rectification would be required when buildings are reported to be defective, dilapidated or dangerous condition that would affect owners/public interest. It may be construed that BMO serves to provide guidance for effective building management/maintenance; while Government would monitor as regulatory body or help to resolve conflict if required. Management/maintenance responsibility still rest with owners.

In order to improve the health/safety condition of buildings and public, a Mandatory Building Safety Inspection Scheme (MBSIS) would be considered for implementation. Owners of old buildings would be obliged to engage qualified professionals to conduct periodic safety inspections of their buildings. However, such proposed scheme has been deferred since firstly discussed in 1987, where severe objections were received from the public. It seems against Common Law practices requiring owners to prove their buildings are structurally sound and free from defects.

3. METHODOLOGY

Based on quantitative approach, questionnaires are sent to solicit property management and

owners' views, with statistical analysis on (1) owners' level of awareness/attitude to current problems, with student's t test; (2) relationship between various factors/variables e.g. owners' initiative versus government's support, with paired samples test on equalities of means; and (3) ascertain possible improvement/remedial actions upon building management/maintenance.

Weighting of five levels are set i.e. "the highest", "high", "moderate", "low" and "the lowest" according to Likert's scale, with a scoring of 5 to 1 respectively to facilitate statistical analysis. For simplicity, some questions are set at "1 for yes" and "2 for no" to expediate return rate. A blank space is also given to express written comment

32 questions, grouped under 2 sections i.e. Section A for general background of respondents, building characteristics, occupation, education level, years living in Hong Kong etc; and Section B for studying respondents' attitude/comments towards building management/maintenance will cover primarily:

- Value of property, management and maintenance;
- Owner's views, responsibility and initiative;
- Owners' knowledge of legislation;
- Sources of owners' maintenance knowledge;
- Owners' views on Government's promotion/support;
- Budgetary and financial concerns

There are 300 target respondents randomly sampled from old districts in New Territories. 46 owners (18 %) validly return the questionnaire, though not a big return rate, but still sufficient for basic analysis ($n > 30$).

4. FINDINGS & ANALYSIS

The following statistical analyses are tabulated for various questions under different clusters:

1. These questions focus on assessing respondents' responsibility towards building maintenance.

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
VAR00009	46	3.8261	.85126	.12551
VAR00012	46	3.8261	.73950	.10903
VAR00023	46	3.3696	.97431	.14365
VAR00025	46	3.8043	.74891	.11042

One-Sample Statistics

All findings hereof are statistically significant at $P < .05$. It reveals that respondents reckon a high consideration for regular maintenance (Q9 = VAR00009 and so on), responsibility (Q12) and acceptance to implement mandatory building inspection policy (Q25); while a moderate to high attitude in preferring Government to look after building maintenance for them at their own cost (Q23).

In addition, for Yes (score 1) and No (score 2) questions, the following analyses are identified:

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
VAR00027	46	2.0000	.00000 ^a	.00000
VAR00028	46	1.1957	.40109	.05914
VAR00029	46	1.4348	.50121	.07390

a. t cannot be computed because the standard deviation is 0.

All respondents reckon that their property has no regular maintenance (Q27). The reason for not carrying out regular building maintenance is mainly due to insufficient budget (Q28). There appears no strong significance (Q29, $p > .05$) in concluding “the reason for not carrying out regular building maintenance is mainly because of consensus from all owners”.

2. These questions focus on assessing respondents' investment/budgetary views towards building maintenance.

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
VAR00010	46	3.7826	.86700	.12783
VAR00011	46	3.7609	.89901	.13255
VAR00026	46	3.5652	1.02528	.15117

The findings here are significant ($p < .05$). Respondents reckon high consideration/worthy to spend on building maintenance (Q10), which can retain their property value (Q11); and feel the necessity to have grants/loans with low interest rate provided by Government for implementing building maintenance (Q26).

3. These questions focus on assessing respondents' legal concepts towards building maintenance.

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
VAR00016	46	3.8913	.31470	.04640

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
VAR00013	46	1.3913	.49344	.07275
VAR00014	46	1.3261	.47396	.06988
VAR00015	46	1.4348	.50121	.07390

Respondents reckon a high degree of knowledge on legislation governing building maintenance (Q16). They moderately know that there are provisions in the Building Management Ordinance relating to building maintenance (Q14). However, there appears no strong significance in concluding that they “know that there are provisions in the Building Ordinance relating to building maintenance” (Q13, $p > .05$); nor they “know that Deed of Mutual Covenant usually have provisions requiring owners of multi-storey building to maintain their common areas properly. Obviously, there is a gap between findings of Q16 and Q13-15. Respondents may have overvalued their overall knowledge on legislation in

maintenance.

4. These questions focus on assessing respondents' opinion towards government's action in building maintenance.

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
VAR00020	46	2.6739	.87062	.12837
VAR00021	46	2.7174	.91075	.13428

All findings hereof are statistically significant at $P < .05$. Respondents show a moderate opinion on “the adequacy of the current promotion (Q20) and degree of success (Q21) on proper building maintenance by Government.

5. These questions focus on assessing respondents' knowledge towards building maintenance.

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
VAR00017	46	1.4348	.50121	.07390
VAR00018	46	1.3043	.46522	.06859
VAR00019	46	1.7609	.43127	.06359
VAR00030	46	1.2609	.44396	.06546

Respondents reckon moderately “that their knowledge on the necessity of building maintenance is obtained from Government publications e.g. posters or pamphlets” (Q18); and moderately “the reason for not carrying out regular building maintenance is mainly because of a lack of knowledge” (Q30). Respondents reckon largely that “their knowledge on the necessity of building maintenance is not obtained from college/technical institute” (Q19). There appears no strong significance in concluding that their knowledge on the necessity of building maintenance is obtained from mass media e.g. TV, newspaper (Q17).

6. These questions focus on assessing respondents' initiative towards building maintenance.

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
VAR00022	46	3.4348	1.04673	.15433
VAR00024	46	3.7609	.73590	.10850

All findings hereof are statistically significant at $P < .05$. Respondents reckon a high degree of agreement that building owners should take the initiative to inspect/maintain their own building (Q24); and a moderate to high willingness to take remedial action if a Repair Order/Investigation Order has been served on their property that rendered dangerous or liable to become dangerous (Q22).

Furthermore, some student's t-tests for equality of means from critical paired samples are also conducted:

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	VAR00009 - VAR00011	.06522	.85381	.12589	-.18833	.31877	.518	45	.607

It reflects no significant difference between the 2 samples/elements ($P > .05$). Respondents reckon high consideration for regular maintenance (Q9) to retain their property value (Q11). This phenomenon is not unusual, as in Hong Kong.

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	VAR00009 - VAR00024	.06522	1.21842	.17965	-.29661	.42704	.363	45	.718

It reflects no significant difference between the 2 samples/elements ($P > .05$). Respondents reckon a high consideration for regular building maintenance (Q9), and also a high degree of agreement that building owners should take the initiative to inspect/maintain their own building (Q24). However, it may be a subjective desire, when it comes to reality e.g. to finance on maintenance, it may not be the case (as demonstrated in following analysis).

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	VAR00010 - VAR00028	2.58696	.93276	.13753	2.30996	2.86395	18.810	45	.000

It reflects a significant difference between the 2 samples/elements ($P < .05$). While respondents reckon high consideration/worthy to spend on building maintenance (Q10), the reason for not carrying out regular building maintenance is mainly due to insufficient budget (Q28). Obviously, there is a gap between perception and reality.

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	VAR00023 - VAR00024	-.39130	1.08481	.15995	-.71345	-.06916	-2.446	45	.018

It reflects a significant difference between the 2 samples/elements ($P < .05$). While respondents reckon a high degree that building owners should take the initiative to inspect/maintain their own building (Q24), they adopt a moderate attitude in preferring Government to look after building maintenance for them at their own cost (Q23). Assistance is sought after from Government on top of self initiative.

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	VAR00013 - VAR00016	-2.50000	.54772	.08076	-2.66265	-2.33735	-30.957	45	.000

It reflects a significant difference between the 2 samples/elements ($P < .05$). While respondents reckon a high degree of knowledge on legislation governing building maintenance (Q16), there appears no strong significance in concluding that they “know that there are provisions in the Building Ordinance relating to building maintenance” (Q13). Obviously, there is a gap between their perception and reality.

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	VAR00014 - VAR00016	-2.56522	.58318	.08598	-2.73840	-2.39203	-29.833	45	.000

It reflects a significant difference between the 2 samples/elements ($P < .05$). While respondents reckon a high degree of knowledge on legislation governing building maintenance (Q16), they moderately know that there are provisions in the Building Management Ordinance relating to building maintenance (Q14). Obviously, there is distinction between perception and reality. Improving their legal knowledge regarding building maintenance would help.

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	VAR00016 - VAR00017	2.45652	.54596	.08050	2.29439	2.61865	30.517	45	.000

It reflects a significant difference between the 2 samples/elements ($P < .05$). While respondents reckon a high degree of knowledge on legislation governing building maintenance (Q16), there appears no strong significance in concluding that their knowledge is obtained from mass media e.g. TV, newspaper (Q17).

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	VAR00016 - VAR00025	.08696	.83868	.12366	-.16210	.33601	.703	45	.486

It reflects no significant difference between the 2 samples/elements ($P > .05$). Respondents reckon a high degree of knowledge on legislation governing building maintenance (Q16), and high acceptance to implement mandatory building inspection policy (Q25).

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	VAR00018 - VAR00030	.04348	.66522	.09808	-.15407	.24102	.443	45	.660

It reflects no significant difference between the 2 samples/elements ($P > .05$). Respondents reckon moderately “that their knowledge on the necessity of building maintenance is obtained from Government publications e.g. posters or pamphlets” (Q18); and moderately “the reason for not carrying out regular building maintenance is mainly because of a lack of knowledge” (Q30). Further publications may not be a critical issue to help improve respondents’ lack of knowledge.

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	VAR00023 - VAR00026	-.19565	1.18546	.17479	-.54769	.15639	-1.119	45	.269

It reflects no significant difference between the 2 samples/elements ($P > .05$). Respondents adopt a moderate attitude in preferring Government to look after building maintenance for them at their own cost (Q23), and feel the necessity to have grants/loans with low interest rate provided by Government for implementing building maintenance (Q26). It appears that respondents demand for financial assistance/loans by Government in a more practical manner.

5. DISCUSSIONS

It reveals that respondents reckon a high consideration for regular maintenance, responsibility and acceptance to implement mandatory building inspection policy; while a moderate to high attitude in preferring Government to look after building maintenance for them at their own cost. Respondents reckon high consideration/worthy to spend on building maintenance, which can retain their property value; and feel the necessity to have grants/loans with low interest rate provided by Government for implementing building maintenance.

Respondents show a moderate opinion on “the adequacy of the current promotion and degree of success on proper building maintenance by Government. Respondents also reckon a high degree of agreement that building owners should take the initiative to inspect/maintain their own building; and a moderate to high willingness to take remedial action if a Repair Order/Investigation Order has been served on their property that rendered dangerous or liable to become dangerous.

Moreover, respondents reckon high consideration for regular maintenance, and worthy to

spend on building maintenance. While respondents reckon a high consideration for regular building maintenance, the degree of willingness to take remedial action upon a Repair Order/Investigation Order is only moderate to high.

While respondents reckon a high consideration for regular building maintenance, they adopt a moderate attitude in preferring Government to look after building maintenance for them at their own cost. Respondents also reckon a high degree that building owners should take the initiative to inspect/maintain their own building; and a moderate to high degree of willingness to take remedial action upon receiving a Repair Order/Investigation Order.

In addition, while respondents reckon a high degree that building owners should take the initiative to inspect/maintain their own building, there appears no strong significance in concluding that they “know that there are provisions in the Building Ordinance relating to building maintenance”. While majority respondents moderately know that there are provisions in the Building Management Ordinance relating to building maintenance; they show a moderate opinion on “the adequacy of the current promotion and degree of success on proper building maintenance by Government. Government would have to do more in this respect.

Furthermore, respondents reckon a high degree of knowledge on legislation governing building maintenance, and highly agree that building owners should take the initiative to inspect/maintain their own building. This sounds positive, yet it may differ when it comes to reality. Respondents reckon moderately “that their knowledge on the necessity of building maintenance is obtained from Government publications e.g. posters or pamphlets”; and there appears no strong significance in concluding that their knowledge is obtained from mass media e.g. TV, newspaper.

Finally, respondents show a moderate opinion on “the adequacy of the current promotion and degree of success on proper building maintenance by Government. It remains a question “to what extent should Government do to improve?” Respondents reckon also a high acceptance to implement mandatory building safety inspection policy, and feel the necessity to have grants/loans with low interest rate provided by Government for implementing building maintenance. It implies that mandatory building safety inspection seems acceptable if Government would financially support.

6. CONCLUSION

The local government would have to increase professional/technical support in advising potential owners to better manage/maintain their buildings; on top of the services/assistance provided via Home Affairs Department, Urban Renewal Authority, Non-Government Organizations and associated bodies. Besides, financial assistance is sought after by owners on top of their self initiative. Currently, there are loan schemes launched by Government via Building Authority, Housing Society, Urban Renewal Authority etc.; which may be revamped for improvement. There appears a strong correlation between owners' acceptance of mandatory building inspection scheme and Government's financial support. In addition, improving owners' legal knowledge regarding building maintenance would help, perhaps more workshops/seminars by legal experts may be organized. Government would have to do more promotions regarding proper building maintenance; and not just rely on publications to improve owners' lack of knowledge. Wider consultation/forums may be held to further solicit owners' views. While owners perceive positively that they are willing, with initiative, to do regular building maintenance; the reality seems not. Primarily, they would expect/demand Government's support in finance and legal/professional education to enhance their knowledge in management/maintenance, though they claim to know. Perception differs with reality, in particular, when people try to rely on others/government' resources to fulfill one's obligation. Is it justified?

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