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Review

Comparative Review of Lift Maintenance Regulations in Beijing, Hong Kong, and London

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Abstract: Lifts, or elevators, are transportation facilities that are indispensable for countless end users in high-rise buildings. They require proper maintenance to ensure safe operation. In addition to technological applications, effective management and legislative controls play a crucial role in ensuring lift safety. Given the limited understanding of an optimal regulatory model for governing lift maintenance, a cross-discipline comparative study was conducted to examine lift maintenance regulations in regions with different legal systems. Following a systematic and comparative review approach, this study focused on regulatory controls across civil and common law jurisdictions, specifically Beijing, Hong Kong, and London. Relevant statutes and publications were searched from engineering, law and management databases, which included Scopus, JSTOR, Lexis+, Lexis China, Lexis Advance Hong Kong, and Westlaw Asia. Through scrutinizing the retrieved documents, key features of the regulations were identified and compared in terms of lift classifications, types and frequencies of mandatory maintenance works, qualifications for authorized parties, and legal liabilities for non-compliance. Validated by industry experts, the results reveal both similarities and differences in the regulations among the three jurisdictions. While these findings serve as valuable references for policymakers in formulating optimal legislative controls to enhance lift safety in the future, further research could expand the scope of this study to examine the regulations in other regions and investigate the effectiveness of existing statutory controls on lift maintenance.

Keywords: code; elevator; law; lift; maintenance; ordinance

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1. Introduction

Lifts, also known as elevators, are indispensable for providing efficient transportation within buildings, especially high-rise structures such as condominiums and office buildings. Lift maintenance is of paramount importance as it plays a critical role in ensuring the safety, comfort and productivity of lift users. Lifts are complex and typically proprietary machines that require regular maintenance performed by specialized service providers. Various stakeholders, including government authorities, building owners, facilities managers and lift users, have vested interests in the proper maintenance of lifts. In addition to technological applications, the legislation and enforcement of appropriate regulations governing lift maintenance are pivotal for the safety of countless lift users in society.

Unfortunately, lifts can experience a variety of problems that compromise their performance. These problems can range from minor malfunctions to catastrophic failures that result in casualties and injuries. For instance, in 2008, a passenger lift in Hong Kong plunged 14 stories to the ground [1,2]. In London, the Tower Bridge lift fell in 2009, with four men and two women suffering leg injuries [3]. The Health and Safety Executive (HSE) brought this case to court, and the lift operating company was fined £50,000 and ordered to pay £50,000 in costs [4]. These accidents are stark reminders of the importance of proper lift maintenance and the need to identify and address potential lift operation problems before they escalate.

From a statutory perspective, governments play a crucial role in regulating lift maintenance. In many countries, regulations have been enacted for the maintenance of lifts, with requirements such as the scope of maintenance activities, parties qualified for undertaking those activities, etc. specified. While maintenance service providers must comply with these regulations to avoid legal liability and ensure lift safety, lift users and building management companies [5] also have the responsibility to report any issues with lift performance to enable timely repairs and prevent potential accidents [6].

Comparative studies on the laws governing subdivided buildings and the provision of infrastructure for building estates have been conducted [5,6]. Regarding lifts in buildings, studies have been carried out on their legal aspects in locations such as Hong Kong [7–9]. Furthermore, technical research on lifts has been conducted, including technological inspections [10], studies on lifespan [11], and evaluations of maintenance performance [12]. However, studies specifically focusing on contemporary laws governing the maintenance of passenger lifts in Hong Kong, a high-density high-rise metropolis known for its East-meets-West environment, have yet to be seen. Given that Hong Kong, currently a Special Administrative Region of China, was a former British colony, this study also includes the capital city of China, Beijing, and the United Kingdom (UK), specifically London.

Aimed at clarifying and comparing statutory lift maintenance requirements in Beijing, Hong Kong and London, the research team identified the following research questions: Q1. What are the statutes governing lift maintenance works in the three cities? Q2. What are the key features and characteristics of these statutes? Q3. Are there any differences between the statutes in terms of the following facets: (i) timing of enactment; (ii) title of statutes; (iii) types of lifts governed; (iv) maintenance activities required; (v) professionals qualified for undertaking the maintenance activities; and (vi) legal liabilities of non-compliance? In view of the above research questions, this study was conducted with the following research objectives: (1) identify the lift maintenance regulations in Beijing, Hong Kong and London; (2) scrutinize the regulations and hence reveal their key features and characteristics; and (3) identify any major commonalities or differences in the regulations in terms of the six facets above.

2. Legal Systems

In Beijing, the legal system is based on civil law [13], which is heavily influenced by Marxist–Leninist ideology and the principles of socialist construction. The socialist legal system with Chinese characteristics forms an organic and unified entity, with the Constitution as the supreme legal authority, the law as its foundation, and the administrative regulations and local laws as essential components. The formation of a socialist legal system with Chinese characteristics to ensure that all aspects of the country and social life have laws to follow is the premise and foundation for the full implementation of the basic strategy of governing the country according to law (e.g., [14]).

Administrative regulations, which are an important part of the socialist legal system with Chinese characteristics, are formulated by the State Council in accordance with the Constitution and laws. This is an important form for the State Council to perform its duties entrusted to it by the Constitution and laws [13]. Administrative regulations may make provisions on matters concerning the implementation of the provisions of laws and the performance of the administrative functions and powers of the State Council, and at the

same time, the State Council may, on the basis of the authorization of the National People's Congress (NPC) and its Standing Committee, first formulate administrative regulations on matters that should be enacted by the NPC and its Standing Committee.

In London, the legal system is shaped by a framework of laws that derive from various sources [15]. Providing a platform for the resolution of disputes through both civil and criminal proceedings, London's legal system embraces the principles of due process, ensuring that individuals are afforded a fair trial and that their rights are protected. Additionally, alternative dispute resolution mechanisms, such as mediation and arbitration, are widely utilized to foster efficient and cost-effective conflict resolution. Overall, London's legal system stands as a beacon of justice, embodying the values of fairness, equity, and the rule of law.

The primary source of law in London is legislation. Acts passed by the UK Parliament establish statutes that cover a wide range of areas. In addition to legislation, common law principles—developed through judicial decisions over centuries—form a significant part of the legal framework. The hierarchy of laws in London follows a pyramid-like structure [15]. At the apex is constitutional law, which includes statutes. Lower down the pyramid, there are laws related to specific areas.

The history of Hong Kong's sovereignty is a complex and controversial topic, involving a variety of political and economic factors that have shaped the region's identity [16]. Prior to the transfer of power in 1997, Hong Kong had been a British colony for over 150 years, during which time it gradually developed into an international financial center. In 1984, the Sino-British Joint Declaration was signed, which stipulated that Hong Kong would be returned to China as a Special Administrative Region with a high degree of autonomy under the principle of "one country, two systems". Since the handover, Hong Kong has maintained its own legal system, which is based on English common law, and is distinct from China's civil law system.

The sources of laws in Hong Kong cover legislation and common law [16]. Legislation is enacted by the Hong Kong Legislative Council and consists of laws passed by the local legislature. Common law principles, inherited from the British legal system, are also an essential part of Hong Kong's legal system. Court judgments serve as precedents and guide future legal interpretation and decision making. The hierarchy of laws in Hong Kong follows a structure where the Basic Law, the mini-constitution of Hong Kong, holds the highest authority. It guarantees the city's autonomy and outlines the fundamental rights and freedoms of its residents. Other laws, including regulations, must comply with the Basic Law.

For the three cities above, there are laws within their legal systems that govern the maintenance work for lifts in buildings. While they share the common goal of ensuring lift safety, differences in regulatory bodies, statutory hierarchy, operational frameworks and other aspects of the cities' legal systems may lead to variations in the specifics of the lift maintenance laws. Understanding the characteristics of these laws is conducive to identifying the best governance model for regulating lift maintenance.

3. Method and Materials

The research team of this cross-discipline study consisted of faculties, students and lift experts in built environments and law disciplines. With reference to the methods of past review studies (e.g., [17,18]) and taking an integrative approach to combine perspectives for creating new insights [19], a systematic process was conducted to search for and analyze the relevant literature and laws governing lift maintenance in the three cities.

The process (Figure 1) began with the Identification phase, during which the research team conducted searches across various databases and platforms, including JSTOR, Lexis+, LexisNexis, Lexis Advance Hong Kong, Lexis China, and Westlaw Asia ("legal sources"). Given that the scope of this study spans the legal, engineering and management disciplines, Scopus ("scientific source")—the largest abstract and citation database of peer-reviewed literature—was also employed in the search process. To obtain the most relevant search

results from these sources, jurisdictional filters ("Beijing", "Hong Kong", and "London") and keywords in combinations of ("lift" or "elevator") and ("law" or "legislation" or "statute" or "provision" or "regulation" or "ordinance" or "guide" or "legal material") were used in the search processes. This initial effort (Phase 1) yielded a large number of records, with a total of 893 identified from the legal sources and an additional 241 from the scientific source.

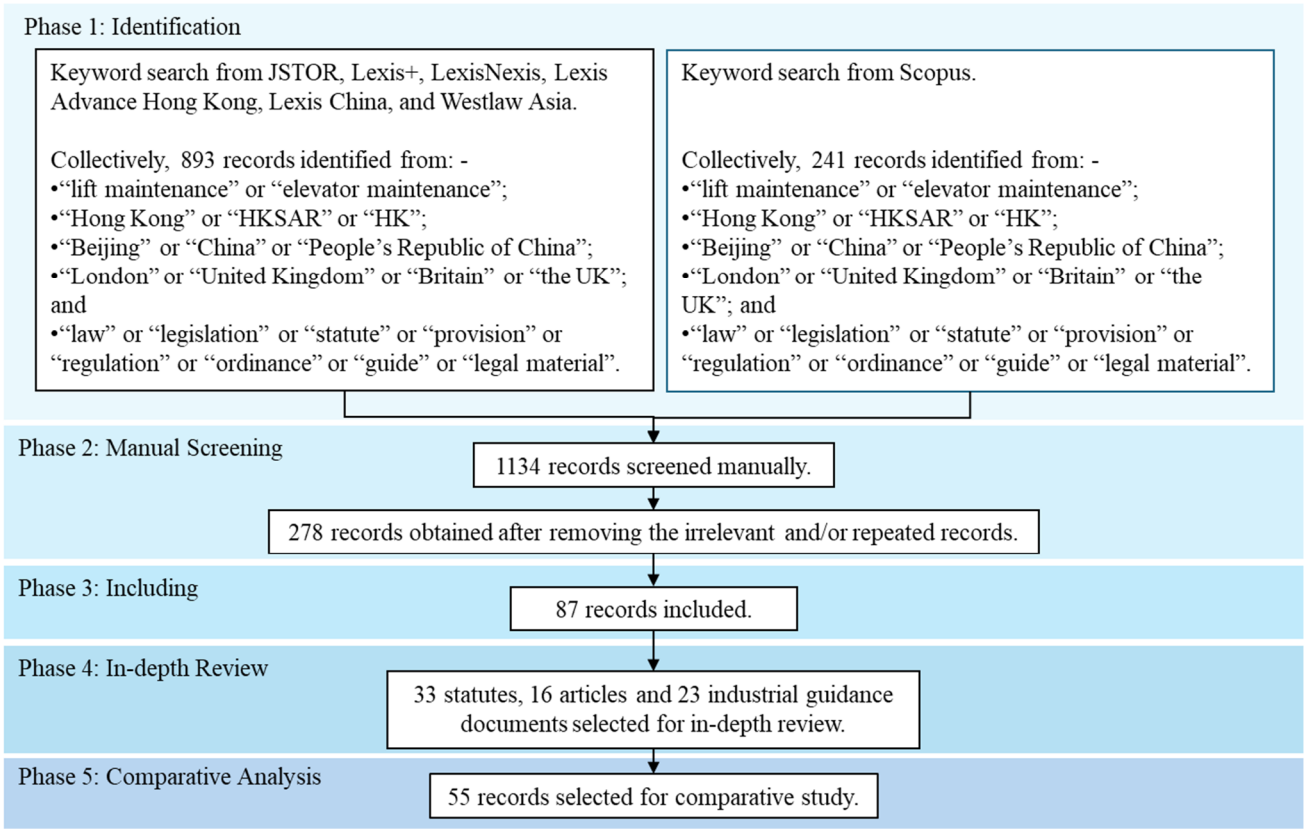

Figure 1. Flowchart of the review process.

Following the Identification phase, the research moved to the Manual Screening phase. A meticulous review of 1134 records was conducted to assess their relevance to the research questions. After this thorough screening process, irrelevant or duplicate entries were eliminated, resulting in 278 records retained for further consideration. This curation ensured that only the most pertinent pieces of information were included in the subsequent analysis.

In the Including phase, the review focus was sharpened further, with 87 records selected for detailed examination. This selection was based on the relevance and potential contribution of each record to the research objectives. In the subsequent In-depth Review phase, a rigorous analysis was conducted on the selected records, which included 33 statutes, 16 scholarly articles and 23 industrial guidance documents. This diverse array of materials provided a rich mix of information for understanding the legal and regulatory landscape surrounding lift maintenance.

The review process culminated in Phase 5—Comparative Analysis—where 55 specific records were chosen for a detailed comparative study. This analysis aimed to draw insights and make connections among the selected documents, including the journals and books listed in Table 1. Concomitant findings, categorized with respect to the foregoing research questions, formed the basis upon which the reviews for the three cities were written. Then, these different parts of reviews were circulated for comment amongst the team members. As an essential step to validate the reviews from the real-world maintenance practice

perspective, an international lift company with maintenance service operations in regions covering Beijing, Hong Kong, and London was invited to comment on the manuscript of this review article. All comments received were addressed and revisions made led to the final version of this article.

Table 1. Journals/books and their publishers.

Journal/Book	Publisher
International and Comparative Law Quarterly	Cambridge University Press
An Introduction to the Chinese Legal System	LexisNexis
Construction Law Journal	Sweet & Maxwell
Environmental Law Institute	Environmental Law Institute
Facilities	Emerald Publishing
HKIE Transactions	The Hong Kong Institution of Engineers
Journal of Building Engineering	Elsevier B.V.
Journal of Business Research	Elsevier B.V.
Journal of Computational Design and Engineering	Oxford University Press
The Hong Kong Legal System	Cambridge University Press

4. Findings and Discussion

4.1. Beijing—Evolution of the Statutory Requirements

In Beijing, the Municipal Government enforces national laws and implements regional regulations for lift maintenance. In 2001, the Beijing Municipal People's Government issued the "Notice on Strengthening the Relevant Issues of Beijing Old Residential Elevator Management" [20], which required thorough checking and inspection of lifts older than 15 years. In 2003, the "Measure of Safety Inspection of Elevators" was enacted [21]. In 2008, the "Beijing Elevator Safety Supervision and Management Measures", covering inspection and testing of elevators, was promulgated [22].

At the national level, the "Regulations on Safety Supervision over Special Equipment (2009 Revision)" was enacted in 2003 ("2003 Regulation") and has a significant influence on lift maintenance policies. The State Administration for Market Regulation ("the SAMR") published "Special equipment production units to implement the main responsibility for quality and safety supervision and management regulations" in 2003, with the requirement that "the quality assurance period of the elevator shall not be less than five years" added. The SAMR also published "Special equipment using units to implement the main responsibility for safety supervision and management regulations", which requires that lift using units should have a lift safety director and lift safety officer in accordance with the law and clear job responsibilities.

The "Special Equipment Safety Law of the People' Republic of China (2013)" applies directly to Beijing and holds a higher status than the 2003 Regulation [22]. Enacted in 2014, the Special Equipment Safety Law establishes regulations and standards for, for example, the operation and maintenance of special equipment. It mandates strict safety inspections, certification procedures, and licensing requirements for manufacturers, operators and maintenance personnel involved with special equipment, as well as the penalties and legal liabilities for non-compliance of the law. Promulgated by the General Administration of Quality Supervision, Inspection and Quarantine of the PRC (GAQSIQ), Section 5 of the Lift Maintenance Regulation (TSG T5002-2017) outlines maintenance units' responsibilities; it specifies maintenance intervals ranging from half-monthly to yearly and requires the development of rescue and emergency protocols [23]. In 2018, the State Council Office published "Opinions of the General Office of the State Council on Strengthening the Quality and Safety of Elevators", which promotes the transformation of the maintenance mode,

pushes forward on-demand maintenance, and promotes new modes such as "all-inclusive maintenance" and "Internet of Things + maintenance".

Recently, the SAMR published the "Regulation for Lift Supervisory Inspection and Periodical Inspection (TSG T7001-2023)" [24] and the Regulation for Lift Examination by the Owner (TSG T7008-2023) [25]. The former updates the inspection procedure, requirements and methodology based on previous six safety technology specifications (i.e., TSG T7001~TSG T7006), adding a one-year transition period for local authorities to choose between the new regulation and the previous specifications; the latter mandates the regular inspections and maintenance by lift owners to ensure safety, including thorough inspections of the lifts' mechanical and electrical components, and proper documentation of these inspections, and focuses on the inspections conducted by relevant organizations, such as special equipment inspection organizations, lift manufacturers, and maintenance contractors, emphasizing their responsibilities in testing and evaluating lifts periodically to meet safety standards. These two regulations have significantly impacted elevator companies, third-party inspection companies, and maintenance companies by providing specific details regarding the practices and qualifications of lift inspectors. Furthermore, the SAMR published "Notice of the General Administration of Market Supervision on the Issuance of the Three Year Action Program for Building the Bottom Line in Elevator Safety (2023–2025)". It mentions the continuous promotion of on-demand maintenance, summarizes the previous pilot experience, and encourages elevator maintenance units to apply remote diagnosis, other technologies, and an "all-inclusive maintenance" model.

4.1.1. Categorization of Lifts and Maintenance Requirements

In Beijing, lifts that pass the supervisory inspection of elevator installation are categorized into two types for maintenance: Type A, which includes lifts suitable for self-inspection, and Type B, which includes lifts that require inspections by qualified personnel. Based on the design and purpose, lifts are subsequently grouped into 11 categories: (i) traction drive passenger and freight elevators, (ii) forced drive freight elevators, (iii) hydraulic passenger and freight elevators, (iv) traction drive firefighter elevators, (v) hydraulic firefighter elevators, (vi) traction drive explosion-proof elevators, (vii) hydraulic explosion-proof elevators, (viii) traction drive inclined passenger and freight elevators, (ix) forced drive inclined freight elevators, (x) escalator and moving walks, and (xi) dumbwaiters. For self-inspection lifts, owners must maintain records of inspections and maintenance accessible to government authorities. Inspections follow the regulations based on lift type and age [26].

The Regulation for Lift Supervisory Inspection and Periodical Inspection specifies items such as the hoisting machine, brake, and suspension system, which require supervisory inspection, and it lists the applicable items for modification or major repair [24]. Other applicable items are inspected according to periodic inspection requirements. Qualified personnel must conduct maintenance, testing, and inspection, with their qualifications and practice status publicly verifiable. Lifts are also subject to periodic inspections by government authorities. The inspection frequency depends on the lift type and usage, typically occurring annually or biannually. The inspection results are documented in an inspection report, which the lift owner must retain and provide to government authorities upon request.

The Regulation for Lift Examination by the Owner requires testing personnel to verify that the testing site meets specific requirements, such as power supply voltage, temperature and humidity [25]. The testing area should be free of unrelated items and equipment, be properly sealed and protected, and display warning signs indicating ongoing testing. The testing unit must establish testing operation instructions, including testing procedures, requirements, methods, and record format. The inspection report must be reviewed and approved by individuals with elevator inspector qualifications or higher, with different personnel signing the testing report. Also, government authorities shall conduct supervisory inspections if they suspect a lift may be unsafe or non-compliant

with regulations, with personnel reviewing technical data, physically inspecting the lift (including macro-inspection, measurement, and functional verification) and performing tests on applicable inspection items. On-site inspections must be conducted by at least two individuals with the necessary inspection qualifications; qualified inspectors should have a college degree or higher in electrical or mechanical engineering. Alternatively, they can have the qualification of assistant engineer in mechanical, electrical, or safety engineering with at least one year of experience in elevator design, manufacturing, installation, debugging, maintenance, inspection, and supervision [27]. The maintainer needs to be qualified according to TSG Z6001-2019 "Examination Rules for Special Equipment Operators" [28].

The regulations governing maintenance and safety of lifts in Beijing are closely connected. To assist with understanding and compliance, Figure 2 helps navigate the regulatory landscape of the relevant regulations. For both Type A and Type B lifts, the requirements of TSG T5002-2017 shall be fulfilled, where the abridged duties of the maintenance unit include the following: (i) formulate maintenance plans and programs; (ii) implement on-site safety protection measures during the maintenance period to ensure the safety of operations; (iii) formulate emergency measures and rescue plans and conduct emergency drills at least once every six months; (iv) set up a 24 h maintenance duty telephone to ensure that the fault is eliminated in a timely manner; (v) make detailed records of elevator failures and other situations in a timely manner; (vi) establish maintenance records for each elevator, classify them into the elevator technical files in a timely manner, and keep the files for at least 4 years; (vii) assist elevator users in formulating elevator safety management systems and emergency rescue plans; (viii) provide safety education and regular skill training for operators undertaking maintenance and archive education and training records for future reference; (ix) carry out at least one self-inspection per year; (x) arrange maintenance personnel to cooperate with special equipment inspection agencies to conduct regular elevator inspections; and (xi) in the process of maintenance, inform the elevator user in a timely manner if the hidden danger of the accident is found, and if a serious accident is found, report it to the local quality and technical supervision department in a timely manner.

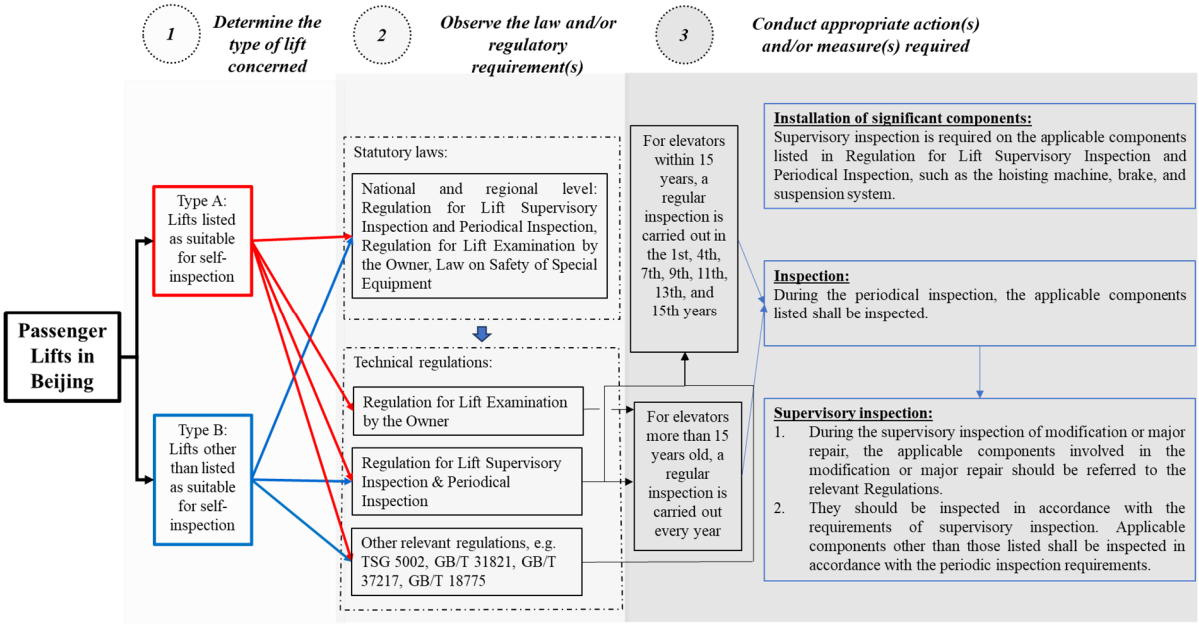

Figure 2. Regulatory controls on lifts in Beijing.

4.1.2. Consequences for Violation of Law

Chapter VI of the Law on Safety of Special Equipment of the People's Republic of China provides the legal liabilities in the case of a violation of the statutory requirements

regarding lift safety maintenance in Beijing. Key provisions in that Chapter, including seven Articles related to lift maintenance, are listed in Table 2.

Table 2. Penalties of non-compliance in Beijing.

	Contraventions	Penalties
(1)	Article 79: Performing special equipment production, installation, alteration, major repairs, and boiler cleaning without supervisory inspection.	• Correction orders within a specified timeframe. • Imposition of a fine ranging from RMB 50,000 to 200,000 (if corrections are not made within the given time limit). • Any illegal income will be confiscated. • In severe cases, the license may be revoked.
(2)	Article 80: Failing to verify and debug elevators according to the safety technical codes or to inform elevator-using unit and report to the department in charge of special equipment safety.	• Correction orders within a specified timeframe. • Imposition of a fine ranging from RMB 10,000 to RMB 100,000 (if corrections are not made within the given time limit).
(3)	Article 88: Engaging in elevator maintenance services without authorization, or failure of elevator maintenance units to conduct elevator maintenance in accordance with the law and safety technical codes.	• Orders to stop violations. • Imposition of a fine ranging from RMB 10,000 to RMB 100,000. • Elevator maintenance units failing to comply shall be punished in accordance with the law. • Any illegal income will be confiscated.
(4)	Article 89: Failure of organizing immediate rescue, being absent without permission, escaping during investigation of accident, late reporting, or misrepresentation or concealment of special equipment accidents.	• Units responsible for the accident: Imposition of a fine ranging from RMB 50,000 to RMB 200,000. • Principal responsible person of the unit: imposition of a fine ranging from RMB 10,000 to RMB 50,000. • If the principal responsible person is a government worker: punishment in accordance with the law.
(5)	Article 92: Failure of special equipment safety management staff, inspectors, and operators to fulfill duties, or violation of operating procedures and relevant safety rules resulting in accidents.	• Revocation of qualifications of the relevant personnel.
(6)	Article 93: (a) Employing unqualified personnel for inspection and testing without or beyond approval; (b) Failure to conduct inspection and testing according to the safety technical codes; (c) Issuing inspection and test results and appraisal conclusions that are false or highly inconsistent with the facts; (d) Failing to inform relevant units and immediately report to the department in charge of special equipment safety when finding serious hidden risks; (e) Taking advantage of inspection duty to deliberately hamper operations; (f) Inspection and testing personnel simultaneously serving at two or more inspection and testing agencies.	• Entity: ○ Orders to make corrections. ○ Imposition of a fine ranging from RMB 50,000 to RMB 200,000. ○ In severe cases, revocation of qualifications. • Directly responsible executive officer and other directly responsible personnel: ○ Imposition of a fine ranging from RMB 5000 to RMB 50,000. ○ In severe cases, revocation of qualifications. • Inspection and testing personnel simultaneously serving two or more inspection and testing agencies: ○ Imposition of a fine ranging from RMB 5000 to RMB 50,000. ○ In severe cases, revocation of qualifications.

Table 2. *Cont.*

Contraventions	Penalties
(7) Article 95: Special equipment manufacturer, operator, user, or inspection and testing agencies refusing to undergo supervisory inspection by the department in charge of special equipment supervision and administration, or special equipment production, operation, and using units utilizing, exchanging, transferring, or damaging seized or detained special equipment or its major components.	• Refusing to undergo supervisory inspection: ○ Ordered to make corrections within a time limit. ○ Failing to make corrections within a time limit: ■ Ordered to stop production and suspend business for rectification. ■ Imposition of a fine ranging from RMB 20,000 to RMB 200,000. • Utilizing, exchanging, transferring, or damaging seized or detained special equipment or its major components: ○ Ordered to make corrections. ○ Imposition of a fine ranging from RMB 50,000 to RMB 200,000. ○ In severe cases, revocation of production license and cancelation of special equipment registration for service.

4.2. Hong Kong—Evolution of the Statutory Requirements

In Hong Kong, the unprecedented plunge of a lift car in a multi-story building to the ground triggered widespread concern over the safety of lifts [29]. Thereafter, the Hong Kong government took follow-up actions, including a review of the Lift and Escalators (Safety) Ordinance (Cap. 327) at the time. After public consultations, a range of amendments to the Ordinance were proposed [8]. Then, the old Ordinance (Cap. 327) was repealed, and the new Ordinance—"Lifts and Escalators Ordinance (Cap. 618)"—came into force in 2012 (Appendix A).

The new Ordinance (Cap. 618) was introduced to enhance control measures, including the following: extending the coverage of the legislation; strengthening the registration regime of personnel engaged in lift and escalator works; increasing the penalty levels of offenses; and improving the regulatory processes to enhance efficiency. Comprising the Lifts and Escalators (General) Regulation (Cap. 618A) and the Lifts and Escalators (Fees) Regulation (Cap. 618B), the Ordinance (Cap. 618) empowers the Electrical and Mechanical Services Department (EMSD) to issue codes of practice.

4.2.1. Types of Lifts

In Hong Kong, passenger lifts in buildings can be classified into two types: (A) lifts for regular passenger use and (B) fireman lifts (Figure 3). Lifts of the latter type, except in emergency situations such as a fire, can be used as ordinary passenger lifts. Being one of the typical fire services installations in mid- to high-rise buildings, fireman lifts have to be provided in accordance with the respective Codes of Practice for Minimum Fire Service Installations and Equipment [30]. Additionally, like with Type B lifts, Type A lifts should comply with the provisions in the Guidebook for RPs [31] and the Code of Practice for Lift Works and Escalator Works [32].

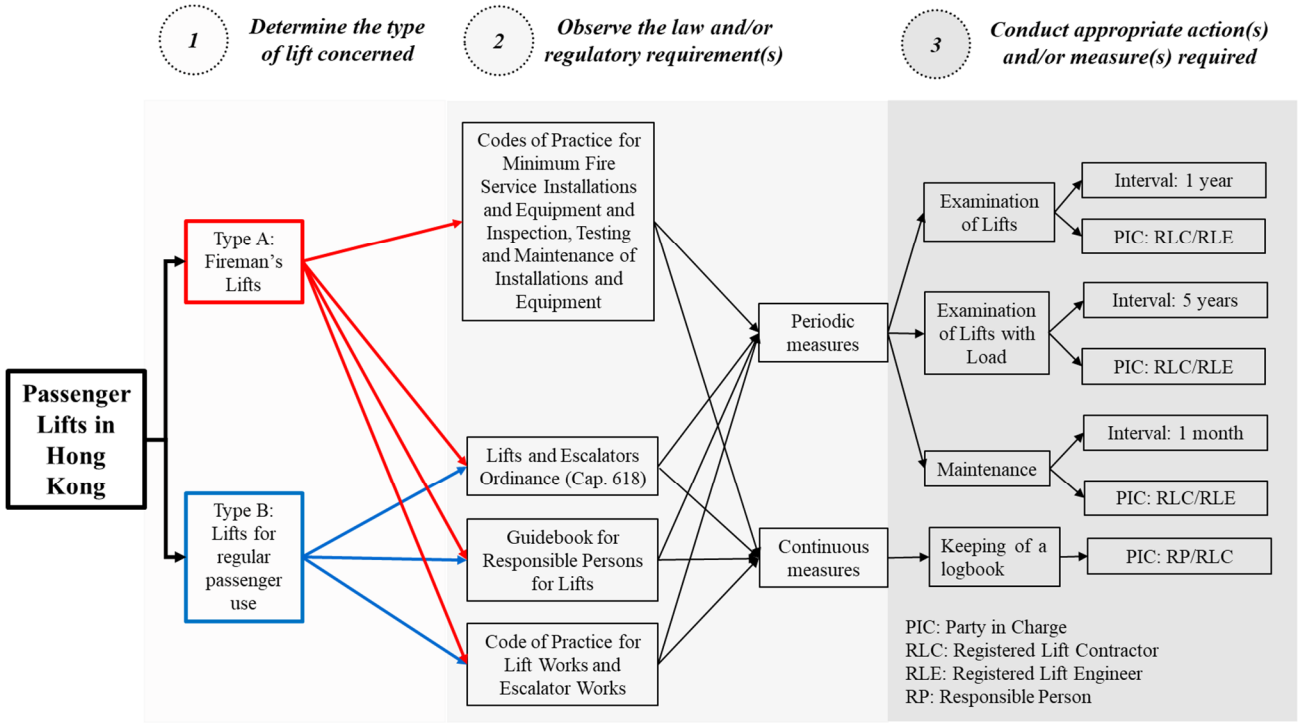

Figure 3. Regulatory controls on lifts in Hong Kong.

4.2.2. Lift Maintenance Works Required

Both Type A and Type B lifts must be provided with statutory maintenance works. Such measures fall into two categories—periodic and continuous. As for periodic measures, the Ordinance (Cap. 618) requires that Responsible Persons ("RPs"), including owners of a lift/escalator and any other person who have the management or control of the lift/escalator, have the duty to ensure their lift is kept in a proper state of repair and in safe working order. The RP for a lift should (i) engage an RLC to carry out periodic maintenance for the lift at intervals not exceeding 1 month; (ii) arrange for an RLE to carry out the periodic examination of the lift at intervals not exceeding 12 months; and (iii) arrange an RLE to carry out the periodic examination of the lift with load at intervals not exceeding 5 years, so as to ensure that the lift and all its associated equipment or machinery are kept in a proper state of repair and in safe working order [31].

A particular continuous measure, following Section 2 of the General Regulation (Cap. 618A), is that the RP for a lift shall maintain a logbook for the lift for at least the recent 3 years, detailing the lift works undertaken, incidents/failures attended to, and inspections conducted by the registered lift/escalator contractors (RLCs), registered lift engineer (RLE) and registered lift worker (RLWs). If the RLC (main contractor) has subcontracted some of the maintenance items to other subcontractors, the names of all the subcontractors should be clearly indicated in the logbook.

Lift works, including the installation, maintenance, repair, alteration, and demolition of lifts, are required to be undertaken by RLCs. RLCs are required to notify the EMSD in respect of undertaking and subcontracting of lift/escalator works. According to Section 8 of the Ordinance (Cap. 618), no person other than the following shall carry out lift works: (i) an RLE; (ii) an RLE, an RLW, or a competent lift worker employed under a contract of employment by an RLC who undertakes the lift works; or (iii) a worker directly supervised, at the site where the lift works are being carried out, by a qualified person mentioned in item (i) or (ii) above.

Note, in particular, that RPs (e.g., owners, property management agencies) are also the party in charge (PIC). They shoulder the responsibility of ensuring that their lift is kept in a proper state of repair and in safe working order. As RPs are usually non-technical parties,

they should engage and have cause to engage RLCs (with RLEs and RLWs) to carry out the statutory lift maintenance works.

4.2.3. Penalties and Remedies

If the RPs for the lift fail to meet the statutory requirements without a valid excuse, they may be prohibited from using or operating the lift. Additionally, non-compliance with the requirements will result in penalties such as fines or imprisonment [31]—refer to Table 3.

Table 3. Penalties of non-compliance in Hong Kong.

	Key Maintenance Requirements under Cap. 618	Penalties
(1)	Section 2: Maintain logbook records as required by the regulations for at least the past 3 years.	Maximum fine at level 3 (HKD 10,000).
(2)	Section 12: Keep the lift and its associated equipment in proper working condition and safe working order.	Maximum fine at level 5 (HKD 50,000).
(3)	Section 13: Take necessary measures to prevent the use of the lift.	Maximum fine at level 6 (HKD 100,000) and 12-month imprisonment.
(4)	Section 15(1): Entrust installation, significant modifications, and demolition of the lift to registered lift contractors.	Maximum fine at level 5 (HKD 50,000).
(5)	Section 15(2): Assign registered lift contractors to perform lift maintenance, including regular maintenance every month.	
(6)	Section 20: Hire registered lift engineer to conduct thorough examination of lift with load and associated equipment.	Maximum fine at level 3 (HKD 10,000).
(7)	Section 21: Employ registered lift engineer to inspect lift after major alterations, ensuring safe operation.	
(8)	Section 22: Engage registered lift engineer to conduct periodic examination of the lift at least once every 12 months.	
(9)	Section 23: Schedule examination for lift with load by registered lift engineer at intervals not exceeding 5 years.	
(10)	Section 39: Display valid use permit visibly inside lift car or in a prominent position near landing area for lifts.	
(11)	Section 40: Notify EMSD and registered lift contractor of serious lift incidents within 24 h (e.g., deaths and injuries).	
(12)	Section 41: Cooperate with EMSD and law enforcement officers by providing necessary assistance for investigations.	
(13)	Section 69: In case of a serious lift incident and the lift cannot resume operation within 4 h of the contractor's awareness, display a notice in a visible location within the lift.	

4.3. London—Evolution of the Statutory Requirements

The Lifts Regulations 2016 were implemented into UK law EU Directive (2014/33/EU), relating to lifts and safety components for lifts (Office for Product Safety & Standards 2024). To meet the Essential Health and Safety Requirements ("EHSRs") [33], the Lifts Regulations 2016 also incorporated, for example, the Lifting Operations and Lifting Equipment Regulations 1998 ("LOLER") (Health and Safety Executive 1998a) and the Provision and Use of Work Equipment Regulations 1998 ("PUWER") [34]. In particular, LOLER implements Directive 89/655/EEC on work equipment safety. It mandates a thorough examination every six months (or as determined by risk assessment) by a competent person who issues a report. The report must notify any defect posing or potentially posing a danger. Serious risks of personal injury require immediate reporting to the relevant enforcing authority, such as HSE or local authority [34,35]. In addition, PUWER aims to prevent or control risks

to workers' health and safety from equipment used at work. It requires equipment to be suitable for use, maintained in a safe condition and inspected at suitable intervals.

Equipment such as stair lifts in private dwellings and platform lifts in shops used for customer access are not governed by LOLER or PUWER [34,35]. Furthermore, they may not be applicable to passenger lifts used by non-working individuals, such as in public areas of shopping centers. If the lift is operated or controlled by an employer or self-employed person in relation to their business, the employer/self-employed person still bears some responsibility for the safety of non-employees. This includes the public using the lift and those who work on or inspect it.

4.3.1. Types of Passenger Lifts

General passenger lifts are primarily intended for carrying general passenger traffic, including standing passengers and individuals using mobility aids like wheelchairs [36]. Escape lifts, as defined in Health Technical Memorandum 05-03 Part E, are used to safely transport staff, patients, and visitors during a fire. They comply with BS 9999 and are under the direction of healthcare facilities management or the fire-and-rescue service [36]. When not used for emergencies, they can be utilized for general purposes by building occupants, reducing the need for a separate lift [37]. Escape lifts are designed to operate during fires for an extended period, typically up to two hours. Their control, requirements and operation are determined by the fire strategy outlined in Health Technical Memorandum 05-03 Part E, with minimum recommendations in BS 9999, BS EN 81-70, BS EN 81-71, BS EN 81-72, and BS EN 81-20 [37].

Firefighter lifts are passenger lifts exclusively provided for the fire-and-rescue service's use during emergencies, primarily intended for general passenger use but equipped with fire protection measures and controls [36]. When not used for firefighting, firefighter lifts can be used as general passenger lifts by building occupants, with dual-entry doors leading to the passenger lobby or firefighting shaft [37]. The requirements for firefighter lifts are specified in Approved Document B of the Building Regulations; further details and approvals can be found in BS 9999. Firefighter lifts should conform to BS EN 81-72 and BS EN 81-20 for electric hydraulic lifts. Compliance with these standards ensures adherence to the Lift Directive's Essential Health Safety Requirements (EHSRs). Additional standards such as BS EN 81-71 apply to vandalism-prone areas, and firefighter lift switches should be provided for immediate control by the fire-and-rescue service [37]. Figure 4 depicts a summary of the above-mentioned regulatory controls in London.

4.3.2. Lift Maintenance Requirements

Passenger lifts and combined goods and/or passenger lifts in workplaces (e.g., offices and factories) are subject to periodic thorough examination as per LOLER and PUWER [33]. This involves a systematic and detailed assessment of the lift by a competent person to detect and report any existing or potential defects, and its extent is determined by assessing risks based on, for example, usage, age, condition, and load weight. Testing and inspection are the two major components: the former is determined based on guidance and standards decided by the competent person and/or duty-holders; the latter is conducted at suitable intervals 'in-house' by a competent, trained employee. Other components include but are not limited to the (i) landing, car doors, and interlocks; (ii) worm and gearing; (iii) main drive system components; (iv) governors; (v) safety gear; (vi) suspension ropes; (vii) suspension chains; (viii) overload detection devices; (ix) electrical devices (e.g., earthing, earth bonding, etc.); (x) braking systems (e.g., buffers and overspeed devices); and (xi) hydraulics [38].

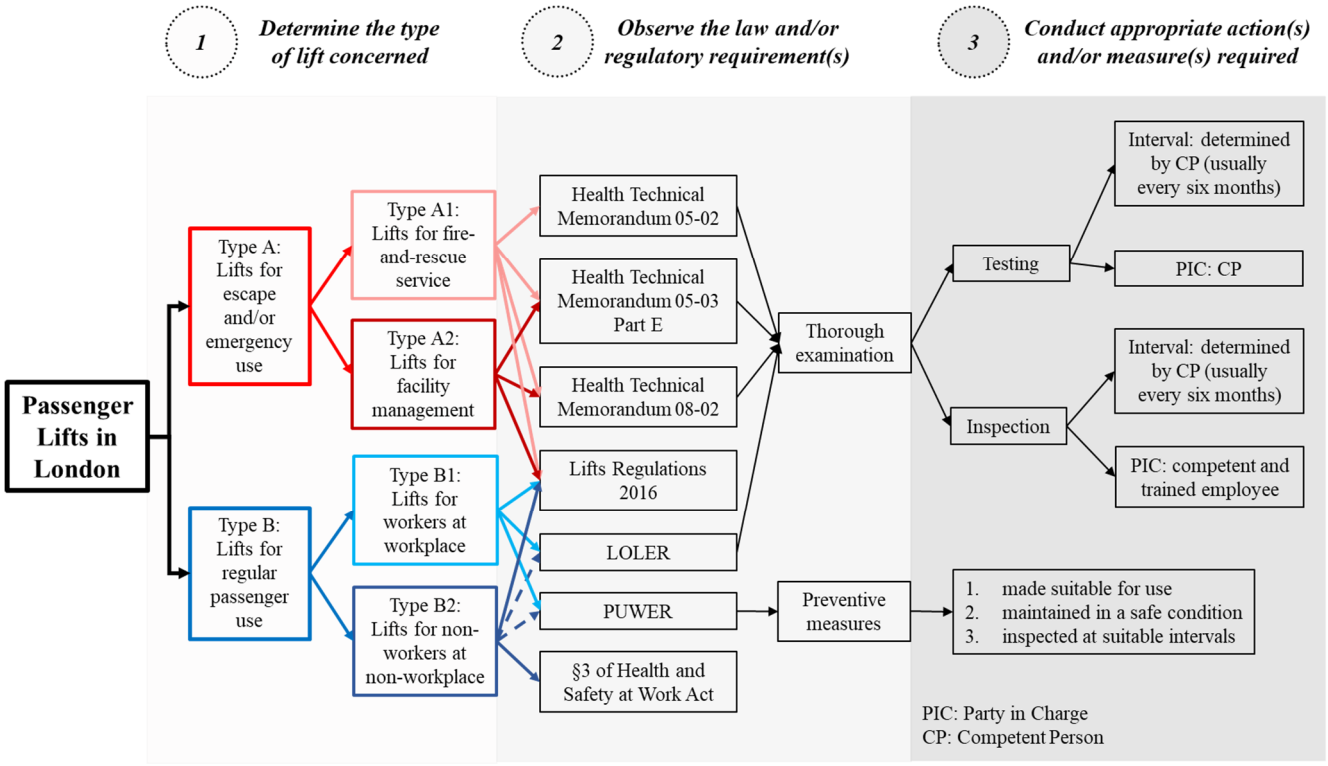

Figure 4. Regulatory controls on lifts in London.

The frequency of examination depends on the lift's purpose: every six months for lifts used by people and every 12 months for lifts used for loads unless an examination scheme is in place. 'Exceptional circumstances' such as damage, long periods of non-use, or major changes in operating conditions also necessitate examination [33]. To qualify for undertaking such works, a competent person should have sufficient technical knowledge, practical experience, and independence to assess the lift objectively. It is not advisable for the same person who performs routine maintenance to conduct a thorough examination. Accreditation by the United Kingdom Accreditation Service to the relevant standard (BS EN ISO/IEC 17020:2004) indicates the competence of an inspection body [39].

Duty-holders are legally responsible for (i) maintaining the lift, (ii) selecting and instructing a competent person, (iii) arranging statutory examinations every six or 12 months (or based on an examination scheme), (iv) informing the competent person of any changes, (v) providing relevant documentation, (vi) addressing defects promptly, (vii) ensuring compliance with regulations, and (viii) maintaining records [33]. For new lifts—those without previous lifts, completely replaced lifts, or with retained guide rails and fixing—an initial thorough examination is not required by the Guide to application of the Lifts Directive—95/16/EC—if they have been manufactured and installed in accordance with the law and possess a current declaration of conformity issued within the past 12 months. Alternatively, a competent person can establish an 'examination scheme' based on a rigorous risk assessment, allowing for different intervals of examination, which may be suitable for infrequently used lifts with light loads.

4.3.3. Legal Liability of Non-Compliance

Duties and offenses in lift maintenance are stipulated in the Lifts Regulations 2016 in London. Table 4 provides a summary of the main provisions.

Table 4. Duties and penalties under Lifts Regulations 2016.

Provision	Duty/Offence
12	Duty to take action for lifts placed on the market that are considered to not be in conformity.
13(2)	Provision of information and cooperation.
14	In order to ensure the proper operation and safe use of the lift, the specific duties relating to buildings or construction where lifts are installed are as follows: (a) Provide with the necessary information; (b) Take the appropriate steps.
70(1)	It is an offense if the party contravenes or fails to comply with the requirement of the above provision(s).
70(2)	It is an offense if the party contravenes or fails to comply with any requirement of a withdrawal or recall notice served to that person by an enforcing authority under these regulations

Regulations 71 and 73 of the Lifts Regulations 2016 are related to law enforcement and liability of violation during the inspection and maintenance of lifts. Regulation 71(1)(a) provides that a person guilty of an offense under Regulation 70 is liable on summary conviction to a fine or imprisonment for a term not exceeding 3 months or to both. As per Regulation 73(1), if one person (A) commits an offense under Regulation 70 due to another's (B) omissions in the course of business, B can be held guilty and punished. Similarly, under Regulation 73(2), if a body corporate commits an offense, a relevant person can also be held guilty if the offense was committed with its consent, connivance, or as a result of negligence. Furthermore, Regulation 73(3) defines "relevant persons" as directors, managers; secretaries, or similar officers of the body corporate; members performing managerial functions in a member-managed corporate body; partners in a Scottish partnership; or individuals purporting to act as a person described in the aforementioned roles.

4.4. Comparison of Beijing, Hong Kong, and London

Proper maintenance is instrumental in ensuring the performance of lifts, and different regions—especially those with different legal systems—have legislated different mandatory requirements for lift maintenance work. However, there have been no comprehensive research studies that review lift maintenance regulations in different jurisdictions in detail. In the following sections, the statutory lift maintenance requirements in Beijing, Hong Kong, and London are compared and discussed in terms of enactment timing, statute titles, lift classifications, and liabilities for non-compliance.

4.4.1. Enactment Timing and Statute Title

The current regulations governing lifts in Beijing were reconciled relatively recently in 2023. Notably, Beijing's lifts maintenance and safety are governed by statutes at the regional and national levels. Hong Kong promulgated the Lifts and Escalators Ordinance in 2012. Incorporated with a range of regulatory enhancements, this Ordinance replaced the former Lifts and Escalators (Safety) Ordinance. London implemented the Lifts Regulations in 2016, which incorporated LOLER, PUWER, and other relevant lift directives.

Another difference between the three cities lies in the titles of the statutes governing lifts in each jurisdiction (Table 5). In Beijing, the main laws governing lift safety bear specific titles, and the keywords therein are the following: inspection, examination, and maintenance. Unlike those laws in Beijing where their titles specify "lift" only, the title of the Lifts and Escalators Ordinance in Hong Kong covers also "escalator". This signifies the comparatively broader scope of this Ordinance. In London, the title of the Lifts Regulations 2016 is concise; this broad title implies that the statute covers all issues about lifts. Yet, the titles of the other two main regulations in London specify their ambits, which are "use" and "operations" of lifting equipment. Comparatively, the title of the Ordinance in Hong Kong indicates that the coverage of this Ordinance is the most comprehensive. As a single authoritative source of governance, this Ordinance covers an inevitably voluminous number of

provisions. On the other hand, the specific and subdivided titles of the main laws in Beijing and London facilitate the prompt identification of specific regulatory requirements, where cross-referencing between those separate yet interconnected regulations is often necessary.

Table 5. Comparison of the three cities.

	Beijing	Hong Kong	London
Main laws	• Regulation for Lift Supervisory Inspection and Periodical Inspection • Regulation for Lift Examination by the Owner • Lift Maintenance Regulation	• Lifts and Escalators Ordinance (Cap. 618)	• Lifts Regulations 2016 • Lifting Operations and Lifting Equipment Regulations 1998 • Provision and Use of Work Equipment Regulations 1998
Scope of control	Elevator, Electromechanical equipment for lifting or transporting people and goods in parallel, including passenger (or goods) elevators, escalators, and automatic walkers, and so on. Except for elevators installed in non-public places and used by single households only.	Provide for the safety of lifts and escalators, including the registration of contractors, engineers and workers for the purposes of carrying out lift works, and escalator works; provide for consequential, incidental and related matters.	The Lifts Regulations 2016 cover various aspects related to the installation, maintenance, and use of lifts/elevators in buildings. They outline the responsibilities of different parties involved, including lift owners, maintenance companies, and competent persons.
Types of lifts governed	Traction drive passenger elevators, traction drive freight elevators, forced drive freight elevators, hydraulic passenger elevators, hydraulic freight elevators, firefighter elevators, explosion-proof elevators (excluding explosion-proof goods elevators), escalators and moving walks, and dumbwaiters.	Every lift in buildings except those under subsection (2) of Cap. 618 (e.g., amusement rides, roller conveyers, hoists used solely for lifting material, lifts solely for use of persons employed in the construction of the building, service lifts in an industrial undertaking, stage or orchestra lifts, etc.)	Lifts Regulations 2016 govern the following: • Passenger lifts; • Goods lifts; • Service lifts; • Platform lifts; • Home lifts; • Dumbwaiters.
Maintenance activities required	• Supervision and inspection procedures: accepting inspection applications, implementing inspections, putting forward inspection opinions, confirming rectification, determining inspection conclusions, issuing inspection reports. • Periodic inspection is based on the passing date of the installation's inspection (or the passing date of transformation inspection).	• Periodic maintenance for the lift at intervals not exceeding 1 month. • Periodic examination of the lift at intervals not exceeding 12 months. • Periodic examination of the lift with load at intervals not exceeding 5 years.	Thorough examination requires (a) testing, where a competent person will determine the tests considering the relevant guidance and standards, and (b) inspection that should be carried out at suitable intervals between thorough examinations and may be carried out 'in-house' by a competent, trained employee, covering visual and functional checks.
Qualified professionals	• Qualified elevator inspector • Qualified elevator maintainer	• Registered lift engineer (RLE) • Registered lift worker (RLW)	A competent person shall have sufficient technical and practical knowledge of the lift, be sufficiently independent and impartial, and be accredited by the United Kingdom Accreditation Service.

Table 5. *Cont.*

	Beijing	Hong Kong	London
Legal penalties and parties accountable for non-compliance with the statutes	• Penalties, e.g., fines ranging from RMB 10,000 to RMB 200,000, revocation of licenses, criminal prosecution, etc. • Persons liable: units, principals, workers, entities, directly responsible executive officers, inspection and testing personnel, etc.	• Penalties: fines up to HKD100,000 and imprisonment for up to 12 months. • Persons liable: RLC, RLE, RLW, etc.	• Penalties: judged on a case-by-case basis; statutorily being a summary conviction to a fine or imprisonment for a term not exceeding 3 months or both. • Persons liable: both the person committing an offense and the person contributing to the offence, such as directors, managers, secretaries, or similar officers.

Note: Detailed requirements refer to the respective laws.

4.4.2. Classification of Lifts

In Beijing, the inclusion of a wide range of lift types suggests a focus on ensuring safety and regulations across different lift installations used by multiple households. In Hong Kong, lifts are classified into two main types: regular passenger lifts and fireman lifts. This classification system reflects a clear distinction between lifts for general use and those designed specifically for fire service installations. Specifically, the specific classification of fireman lifts underscores the importance of providing dedicated lift systems for emergency response purposes, which ensures that fireman lifts are appropriately maintained and equipped for efficient and safe rescue operations. In London, the classification of lifts is more detailed and encompasses different types based on their purpose and usage. The regulations distinguish general passenger lifts, escape lifts used during fires, and firefighter lifts. This recognizes the specific functionalities and accommodates the safety requirements associated with different lift types. On the whole, the variation in lift classification across these three cities reflects the different regulatory approaches and the specific considerations given to the purpose, safety, and operational requirements of lifts.

4.4.3. Lift Maintenance Works and Qualified Parties

The three jurisdictions have specific requirements on different aspects of lift maintenance to ensure safety and compliance. While the specific maintenance requirements may vary, all three cities acknowledge the importance of regular upkeep to ensure lift safety and performance. Rather than condition-based maintenance, which is a policy by which maintenance actions are taken before equipment failures happen and the risk of the failures are predicted in a real-time way [40], time-based maintenance is the strategy commonly enshrined in the statutory lift maintenance requirements across the three cities. In Beijing, maintenance units have been encouraged to use on-demand maintenance, remote diagnosis, and Internet of Things for lift maintenance. In some other places such as Singapore, its Building and Construction Authority (BCA) has also started to consider how the lift industry could benefit from condition-based maintenance [41]. To support the implementation of this maintenance strategy, the BCA has made changes to the Building Maintenance and Strata Management (Lift, Escalator and Building Maintenance) Regulations 2016 and developed a Code of Practice for a Design and Performance of Remote Monitoring and Diagnostics (RM&D) Solution for Lifts [42]. Lifts outfitted with a compliant RM&D Solution may be allowed a longer maintenance interval [43]. While it is not definite whether such regulatory changes will become a worldwide trend, this case serves as a reference for other cities, including Hong Kong and London, to consider the appropriateness of incorporating the adoption of a condition-based strategy and smart technologies in their lift maintenance regulations.

The current lift regulations of Beijing emphasize periodic maintenance, inspections, and examinations. This means that lifts are expected to undergo regular maintenance

and examination at predetermined intervals to ensure safety and adherence to standards. In Hong Kong, RP for a lift shall maintain a logbook for the lift for at least the recent 3 years and lifts should undergo periodic maintenance for the lift at intervals not exceeding 1 month by an RLC, at intervals not exceeding 12 months by an RLE, or for lifts with load at intervals not exceeding 5 years by an RLE. In London, the Lifts Regulations 2016 provide that owners and operators are responsible for ensuring regular maintenance, thorough examinations, and the implementation of safety measures by a competent person at least every six months. For lifts used for evacuation purposes during a fire, a thorough examination should be conducted at least every 12 months, alongside routine inspections, cleaning, testing, lubrication, and the repair or replacement of components. Overall, Beijing's regulations emphasize periodic maintenance and examination, with specific time intervals or frequencies annexed in other instruments outside its statutes. Hong Kong's lift maintenance requirements include annual thorough examinations, while London's regulations specify a minimum frequency (half-yearly) for a thorough examination.

In governing the qualifications for lift professionals, the approaches of Beijing, Hong Kong, and London are not identical. In Beijing, the specific professional qualifications include a college degree or higher in electrical or mechanical engineering, or the qualification of assistant engineer in mechanical, electrical, or safety engineering with at least one year of experience in elevator design, manufacturing, installation, debugging, maintenance, inspection, and supervision. The exact certification or licensing requirements would need to be obtained from local governing authorities, and the examination rules are stipulated in the Examination Rules for Special Equipment Operators (TSG Z6001-2019). In Hong Kong, the RLE and RLW are responsible for performing maintenance activities, who must hold valid registrations issued by the EMSD. In particular, the two routes to become an RLE are (i) a party who is a registered professional engineer in a relevant discipline (e.g., mechanical engineering, building service engineering) and has an aggregate period of not less than 2 years of relevant working experience in lift works and (ii) a party who has a bachelor's degree in the relevant discipline, or equivalent or higher qualifications as the Registrar may approve [44]. In London, the law requires thorough examinations of lifts to be conducted by competent people. Such parties shall have sufficient technical and practical knowledge of the lift, be sufficiently independent and impartial, and be accredited by the United Kingdom Accreditation Service.

4.4.4. Legal Liabilities and Penalties

The three cities have specific legal penalties in place to ensure the safety and maintenance of lifts. In Beijing, the Law on Safety of Special Equipment outlines various contraventions and their corresponding penalties. Violations such as failure to comply with inspection requirements or engaging in elevator maintenance without authorization can result in fines ranging from RMB 10,000 to RMB 200,000, revocation of licenses, or even criminal prosecution. In Hong Kong, the regulations for lift maintenance require logbook records, proper working condition, and necessary measures to prevent unauthorized use. Penalties for non-compliance include fines up to HKD 100,000 and imprisonment for up to 12 months. Failure to meet statutory requirements can lead to the prohibition of lift use or operation. In London, the Lifts Regulations 2016 provide the range of penalties in Regulation 71, which is summary conviction to a fine or imprisonment for a term not exceeding 3 months, or both. With respect to the accountability measures, Regulation 73(1) allows for holding accountable both the person committing an offense and the person contributing to it, while Regulation 73(2) holds relevant individuals liable if a corporate body commits an offense through their consent, connivance, or negligence. Hence, all three places prioritize lift safety and enforce compliance through legal frameworks, with London's punishment provision being the harshest.

With respect to the parties liable for non-compliance with the lift maintenance regulations, there are differences between the cities. In Beijing, such responsibilities primarily rest with the individuals or corporate bodies directly involved in the offenses, as reflected

in the Law on Safety of Special Equipment. In particular, the law confers liability to units, principals, or government workers who are responsible for the accident, entities, directly responsible executive officers, and inspection and testing personnel. In Hong Kong, the legal liability mainly goes to individuals or entities directly responsible for lift maintenance and operation, such as the RP, RLC, RLE, and RLW. In London, the legal liability extends beyond the individuals directly involved in the offenses. Under the Lifts Regulations 2016, both the person committing the offense and the person whose actions or omissions contributed to the offense can be held accountable. Relevant individuals within a corporate body, such as directors, managers, secretaries, or similar officers, can be held personally responsible if the offense was committed with their consent, through connivance, or because of their negligence. Therefore, while Beijing holds the directly responsible parties accountable, Hong Kong places responsibility on parties directly involved in managing or handling lift maintenance work. In furtherance of this, London extends the responsibility to both the direct and indirect participants.

In principle, imposing heavier penalties should be more able to deter non-compliance with the statutory requirements. However, enforcing regulatory control is neither effortless nor costless. Excessive control beyond the optimal extent may even incur institutional costs that outweigh the consequential cost of non-compliance [8]. To ascertain the effectiveness of the existing statutory control, it is essential to evaluate not only the input resources for the control measures but also the outcome performance resultant from the measures. Examples of such outcome performance indicators include the number of lift incidents and their seriousness (e.g., injuries or fatalities). Investigations into these indicators across different regions, if undertaken in future research, would help evaluate the effectiveness of different statutory controls on lift maintenance.

5. Conclusions

In the absence of any prior research that provides a comprehensive review of lift maintenance regulations in different jurisdictions, this study was initiated to contribute to the body of knowledge in this area. This study highlights the importance of lifts and their maintenance for stakeholders, including policymakers, maintenance service providers, facilities managers and lift users. In addition to emphasizing the seriousness of poor lift performance, a clear picture of the legal systems and lift maintenance laws in Beijing, Hong Kong and London, which include their key features and characteristics, was portrayed.

The interdisciplinary collaboration of the research team highlights the importance of integrating perspectives from researchers in the engineering, law and management fields. In using a systematic method to search the relevant literature, the principal lift maintenance statutes of the cities were identified. The comprehensive literature review findings, which were validated by lift maintenance experts in the field, resulted in answers to the research questions set forth for this study. Similarities aside, the answers unveil differences between the cities' statutory requirements in the classifications of the lifts being governed, types and frequencies of the maintenance activities required, qualifications of the registered parties undertaking the maintenance activities, and legal liabilities of non-compliance with the statutory requirements. These findings can serve as a reference for future researchers conducting comparative law review studies in other regions, not just on lifts but also on other facilities whose safe operation is critical to their end users. In addition to this implication, the findings also provide practical value to stakeholders such as facilities managers and international companies that manage or deliver maintenance services for lifts across different regions.

Besides the above review findings, a noteworthy observation is that time-based maintenance is the strategy enshrined in the statutory lift maintenance requirements of the three cities. Whether the time-based strategy is more effective than the condition-based strategy and whether a hybrid approach that integrates the two strategies would lead to a more effective statutory control system on lift maintenance are among the topics for future research. The effectiveness and hence the appropriateness of mandating the use of smart

technologies such as remote condition monitoring and diagnosis to substitute or augment time-based maintenance work should also warrant further studies.

Admittedly, this review study is limited by the databases and keywords employed in the literature search process, and the scope of this study was confined to the mandatory lift maintenance requirements stipulated in the relevant statutes of Beijing, Hong Kong and London. Further studies may take an approach similar to that of this study to review the regulations governing lift maintenance in other jurisdictions. More comprehensive studies could even expand the research scope to include critical reviews on the law reports of precedents in this field, from which the legal principles derived from the court decisions could be identified for analysis against the statutory requirements contained in the regulations.

To evaluate the effectiveness of statutory controls on lift maintenance, it is essential to assess both their input resources and outcome performance. To this end, further studies should include, in their scope of investigation, the performance of lifts in terms of, for example, the number of lift incidents and their seriousness. Future research investigating these indicators across different regions could provide valuable insights into the effectiveness of various statutory controls on lift maintenance; then, law-makers would be better informed when it is necessary to amend lift maintenance regulations for better and safer lift performance.

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Appendix A. Laws Cited

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(1) Cap. 327 Lifts and Escalators (Safety) Ordinance (Repealed).
(2) Cap. 618 Lifts and Escalators Ordinance.
(3) Cap. 618A Lifts and Escalators (General) Regulation.
(4) Cap. 618B Lifts and Escalators (Fees) Regulation.

People's Republic of China

(1) Building Maintenance and Strata Management (Lift, Escalator and Building Maintenance) Regulations 2016.
(2) Code of Practice for Design and Performance of Remote Monitoring and Diagnostics (RM&D) Solution for Lifts.
(3) Examination Rules for Special Equipment Operators (TSG Z6001-2019).
(4) Law on Safety of Special Equipment of the People's Republic of China 2013.
(5) Lift Maintenance Regulation (TSG T5002-2017).
(6) Regulation for Lift Examination by the Owner (TSG T7008-2023).
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(8) Regulation for Lift Supervisory Inspection and Periodical Inspection.
(9) Regulation for Lift Supervisory Inspection and Periodical Inspection (TSG T7001-2023).
(10) Regulations on Safety Supervision of Special Equipment (2009 Revision).
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