



LIFT & 電梯通訊 ESCALATOR NEWSLETTER

Feature Article

Design and Application of Mechanized Vehicle Parking System

A mechanized vehicle parking system (MVPS) is a mechanical plant that has a power operated mechanism for conveying a vehicle to a parking space within the plant. Under the Lifts and Escalators Ordinance, MVPSSs are regarded as lifts, and their design, construction and maintenance are subject to regulatory control.

Uses of MVPSSs

Compared to traditional multi-storey car parks, the key advantage of MVPSSs is that they can provide more parking spaces on the same floor area, thus alleviating the shortage of parking spaces. Through flexible and innovative design solutions, MVPSSs can even multiply the number of parking spaces in confined urban spaces. MVPSSs can be installed outdoors or within buildings, including residential buildings, commercial buildings, hotels, hospitals, mixed-use developments, as well as public transport hubs such as railway stations and airports, and are also applicable to revitalisation projects of old buildings.

Types of MVPSSs

There are various types of MVPSSs that can be selected based on factors such as space constraints, installation and operation costs, relevant design standards, and whether there is an attendant operating the system on site. Several common types of MVPSSs in Hong Kong, the Mainland and overseas are presented below:

1. Puzzle Stacking System

In a puzzle stacking system, each parking pallet can independently move up and down and in the horizontal direction to store and retrieve vehicles. The puzzle stacking system is the most common type of MVPSS in Hong Kong. It is typically two to six levels in height, and can be installed indoors or outdoors.

The design of the puzzle stacking system is simple and highly flexible. Not only are the installation and maintenance costs relatively low, but the design also allows great flexibility in utilising limited space for parking. Taking a car park revitalisation project at an industrial building in Hong Kong as an example, there was space available for parking one vehicle behind the structural columns of the building. However, vehicles were unable to manoeuvre into or out of such space, hence it could

not be used for parking originally. After installing the puzzle stacking system in the car park, vehicles can be stored into and retrieved from the space behind the structural columns as the parking pallets in the system can be shifted horizontally, so the number of parking spaces can be further increased.



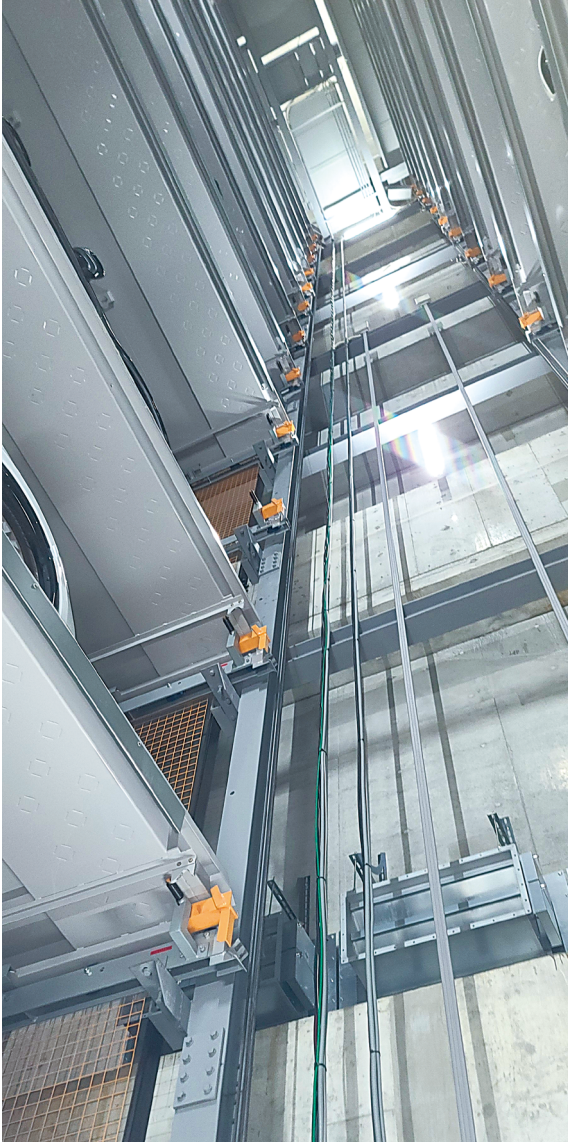
Puzzle stacking system



After installing the puzzle stacking system, the space behind the columns can also be used for parking

2. Tower Lifting System

A tower lifting system is usually installed in buildings with 10 to 20 stories. The system has a lifting platform in the middle, and the user will first park his/her vehicle on the parking pallet installed on the lifting platform. After the user leaves the MVPS, the vehicle will be elevated to the designated level by the lifting platform. The vehicle on the parking pallet will then be conveyed to the parking space on the left or right side of the lifting platform by mechanical devices.

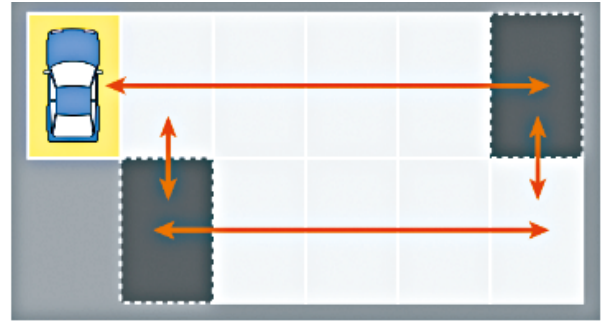


Tower lifting system

The greatest advantage of the tower lifting system is its efficiency in vehicle retrieval. As the lifting platform of the system can travel between levels at high speed, the time a user needed to retrieve his/her vehicle is significantly reduced. In addition, the tower lifting system has fewer motors and moving parts compared to typical MVPSSs, which can also lower the installation and maintenance costs and time.

3. Horizontal Circulation System

In a horizontal circulation system, the parking pallets can move independently in lateral and longitudinal directions, and they circulate on the same plane to transport vehicles to the entrance/exit or parking spaces of a parking level. The entrances/exits of different parking levels can be combined with a lifting platform to create a multi-level horizontal circulation system.



Method of operation of the horizontal circulation system



A horizontal circulation system equipped with a lifting platform

While no horizontal circulation system has been installed in Hong Kong yet, these systems are quite common in other countries such as Japan, and are typically installed in the long and narrow basements of buildings. The main advantage of the system is its extremely high parking density, which allows it to effectively increase the number of parking spaces in a building.

4. Circular Shaft Lifting System

A circular shaft lifting system is generally around 10 levels high, with 8 to 12 parking spaces on each level installed around the circular shaft. The central lifting platform of the system is equipped with a turntable mechanism. After a vehicle is transported to the designated level by the lifting platform, it will be rotated by the turntable to face the assigned parking space, and then moved into the parking space by mechanical devices.



Circular shaft lifting system

If there is a need to increase the number of parking spaces in a cylindrical building or underground space, installing a circular shaft lifting system will be a suitable solution. However, due to the complex design of the circular shaft lifting system, its construction costs are generally higher than other MVPSSs.

5. Vertical Lifting and Horizontal Sliding System

A vertical lifting and horizontal sliding system is generally installed in large car parks with three to ten levels and large number of parking spaces. A vehicle is first conveyed to the target level by a lifting platform, then moved horizontally to the designated parking space by a transfer vehicle, and finally placed into the assigned parking space by a shifter.



Vertical lifting and horizontal sliding system

In a conventional car park with a large number of parking spaces, it is generally not easy and time-consuming for users to find their own vehicles. The vertical lifting and horizontal sliding system can solve the above problem by automatically transporting the vehicles to a pickup area near the users, effectively enhancing the user experience.

Design Considerations

Any MVPS proposed for installation in Hong Kong must comply with the **European Standard EN 14010 – Safety of machinery – Equipment for power driven parking of motor vehicles – Safety and EMC requirements for design, manufacturing, erection and commissioning stages**. In addition to mechanical safety, project proponents must pay attention to noise, fire and building safety requirements, operation of MVPSs and their impact on adjacent road traffic, as well as compatibility with the surrounding land uses. The design of MVPSs should also include emergency facilities such as backup power supply to allow conveyance of vehicles to the ground level in manual mode in the event of power outage or equipment failure. For details, please refer to the [Guideline for Implementing Mechanized Vehicle Parking Systems](#) issued by the Electrical and Mechanical Services Department (EMSD).

Guideline for Implementing
Mechanized Vehicle Parking Systems



Examples of MVPSs Installed in Hong Kong



The puzzle stacking system at
the EMSD Headquarters



The puzzle stacking system at
Hoi Shing Road, Tsuen Wan



The vertical lifting and horizontal sliding system at
Sze Mei Street, San Po Kong (under construction)
(Image contributed by the Transport Department)



The circular shaft lifting system at Yen Chow Street,
Sham Shui Po (at the design stage)
(Image contributed by the Transport Department)

Latest Development of the Digital Log-books System for Lifts and Escalators

The Electrical and Mechanical Services Department (EMSD) has rolled out the Digital Log-books for lifts/escalators (the Digital Log-books) to digitalise the maintenance records of lifts/escalators and replace conventional paperbound log-books. The Digital Log-books enable responsible persons for lifts/escalators (RPs), registered lift/escalator contractors (RCs), trade practitioners and the EMSD to monitor, record, manage and analyse the maintenance records of lifts/escalators in real time through a mobile app or web portal. It facilitates joint monitoring of the relevant work by various stakeholders, thereby uplifting the management and safety standard of lifts/escalators.

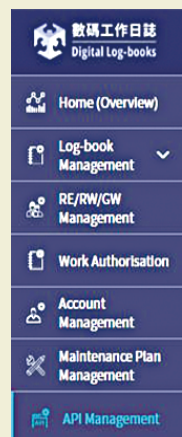
Since its official roll-out in November 2022, the Digital Log-books has received high acclaim from the lift/escalator trade, property management sector and RPs, and its adoption rate has been increasing steadily. As at June 2024, more than 40 000 lifts and escalators have adopted the Digital Log-books, accounting for about 50% of the total number of lifts and escalators in Hong Kong. Besides, the EMSD added new functions to the Digital Log-books progressively in the first half of 2024 to facilitate users' management of lifts/escalators:

New function 1 – Application Programming Interface (API)

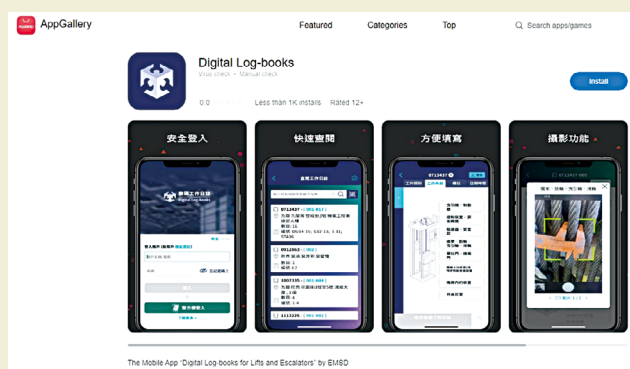
Many property management companies and RCs have computer systems to store and analyse lift/escalator data. An "Application Programming Interface (API)" function has been added to the web portal of the Digital Log-books. It facilitates information exchange between users' own computer systems and the Digital Log-books by automatically transferring works data on the Digital Log-books to users' computer systems for further analysis.



Facilitate information exchange by API



API function of the Digital Log-books



Downloading the mobile app of Digital Log-books from Huawei AppGallery

New function 2 – HarmonyOS-compatible version of mobile app released

The EMSD has released a HarmonyOS-compatible version of the mobile app of Digital Log-books. Users of the Digital Log-books using devices running on HarmonyOS can download the mobile app of Digital Log-books from [Huawei AppGallery](https://appgallery.huawei.com) for use.



Huawei AppGallery



Email



Website

Activation of the Digital Log-books

The Digital Log-books has been officially launched for use free of charge. For those who are interested in using the Digital Log-books, please email to digitallogbooks@emsd.gov.hk. Designated staff of the EMSD will contact you to activate the relevant Digital Log-books upon receipt of the email.

For further details, please call the hotline for the Digital Log-books on 3741 8880 (for enquiries related to information technology) or 9761 6685 (for enquiries related to the operation) between 9am and 6pm from Monday to Friday (except public holidays). Members of the public may also visit this [website](https://www.emsd.gov.hk) to learn more about the various functions and benefits of the Digital Log-books.

News **-in-** Brief

Join in the Modernisation of Aged Lifts and Escalators

Even with proper maintenance and examination, aged lifts and escalators are more prone to issues such as ageing parts, long maintenance time and discontinued production of spare parts. Modernisation of aged lifts and escalators not only enhances their safety level and minimises the occurrence of breakdowns, but also reduces energy expenses and operating costs. To raise public awareness of modernisation of aged lifts and escalators, the EMSD published newly designed promotional posters and leaflets on modernisation of lifts and escalators in 2024, introducing seven lift modernisation solutions and eight escalator modernisation solutions. RPs can visit the webpage [Lift/Escalator Modernisation Resource Corner](#) to download the latest promotional posters and leaflets on modernisation of lifts and escalators.

Lift/Escalator Modernisation Resource Corner



In addition, to further promote the modernisation of aged lifts, in February 2024, the EMSD displayed promotional posters on lift modernisation on 72 post boxes, and focused the promotion in districts with more aged lifts, including Sham Shui Po, To Kwa Wan, Shau Kei Wan and Sai Ying Pun, to remind RPs to carry out modernisation works for aged lifts.



Promotional poster on lift modernisation



Promotional poster on escalator modernisation

News **-in-** Brief

The Sixth Term of the Lift and Escalator Safety Advisory Committee

The Lift and Escalator Safety Advisory Committee (LESAC) was established on 9 July 2013. Its main function is to advise the Director of Electrical and Mechanical Services on administrative and enforcement matters related to the Lifts and Escalators Ordinance (Cap. 618). The Secretary for Development has appointed the members of the latest term (i.e. the sixth term) of the LESAC, and each member will serve until 8 July 2025. The list of the members of the LESAC is as follows:

Membership Category	Name
Chairperson	Ir KO Chi-wai, Gary
Professional Bodies	Ir HO Sau-chiu
Lift and Escalator Trade	Mr KUOK Hoi-sang Mr LI Kwan-chi, Simon Mr LEE Ling-kit, Anka Mr KWOK Hing-wun
Training Institutions	Mr THONG Wang-fai, William Mr LAI Ka-kui
Property and Facility Management Sector	Ms WONG Hiu-kwan Sr LEE Man-kwong Ms CHAN Nga-yan
General Community	Ms CHEUNG Yan-fan, Angel Mr CHOW Siu-fai Ms LAU Pui-yuk Ms WONG Hoi-yung, May Mr WONG Chun-ho, Franky

Membership Category	Name
Official Members	[Representative of the Home Affairs Department] Ms LEUNG Wai-chun, Karmen [Representative of the Electrical and Mechanical Services Department] Mr CHAN Pak-cheung

Ir KO Chi-wai, Gary
Chairperson of the LESAC

News -in- Brief

Recent Prosecution Cases

From 1 May 2023 to 30 April 2024, the EMSD issued a total of 36 summonses to initiate prosecution against 5 persons/ companies suspected of having contravened the Lifts and Escalators Ordinance. Below is a summary of the cases:

Case 1

A lift incident involving breakage of suspension ropes occurred in a building in Kwai Chung in December 2022. Upon investigation, the EMSD suspected that the incident was related to improper maintenance, and brought a total of four charges against the registered lift contractor and the registered lift worker responsible for carrying out the maintenance works for the lift concerned, and the registered lift engineer responsible for examination of the lift concerned. The case is still in trial.

Case 2

During investigation of a reported case in a housing estate in Tseung Kwan O in April 2023, the EMSD found that two registered lift workers confirmed on the log-book that periodic maintenance works had been completed, even though they had not carried out any maintenance works. The EMSD prosecuted the two registered lift workers for providing false or misleading information on the log-book, and brought a total of 32 charges against them. Both of them were convicted and each sentenced to a community service order of 240 hours.

News -in- Brief

Lift and Escalator Works Safety in Hot Weather

Hong Kong has entered the hot summer season, and the EMSD reminds RCs to take appropriate measures to alleviate the hot working condition faced by frontline workers.

Frontline workers who work in indoor environments without air conditioning (e.g. lift shafts and machine rooms) face high levels of heat stress and are at a relatively higher risk of heat stroke. RCs should, by making reference to the "Guidance Notes on Prevention of Heat Stroke at Work" and "Introduction to the Heat Stress at Work Warning" published by the Labour Department (LD) in 2023, assess the risk factors of heat stress for frontline workers at work and formulate appropriate preventive and control measures, including rescheduling work periods, providing ventilation and heat dissipation equipment, and reminding employees to replenish water and rest in a timely manner, so as to ensure the occupational health of frontline workers.

RCs may refer to the relevant guidelines and publications issued by the LD through the following links:

1. [Guidance Notes on Prevention of Heat Stroke at Work](#)
2. [Introduction to the Heat Stress at Work Warning](#)
3. [Risk Assessment for the Prevention of Heat Stroke at Work](#)



Guidance
Notes



Introduction
to Heat Stress



Risk
Assessment

Feedback

Your comments and suggestions, whether on editorial style or contents, are most welcome. Tell us how we can improve and make the Lift and Escalator Newsletter a truly informative and interesting publication for you. The Lift and Escalator Newsletter is available on our website at <http://www.emsd.gov.hk>.

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