

2.3.6.1 Kuala Lumpur Express Rail Link, Malaysia

Key information	
Airport(s) served	Kuala Lumpur International Airport, Kuala Lumpur International Airport 2
Airport traffic	47.5 million (2013)
Length	57 km (KL Sentral–KLIA); 59.14 km (KL Sentral–KLIA-2)
Passenger volume	19,000 passengers daily (2014)
Location of city station	KL Sentral (city centre)
Bag check-in at city station	Yes
Fare system	Cloud-based automated fare collection system, one-way tickets and passes, new gates accept existing public transport contactless smart cards and bank cards
Operating speed	160 km/hr
Track gauge, power system, and technology	1,435 mm, overhead lines, TETRA

City background: The city of Kuala Lumpur, popularly called KL, is the capital of Malaysia. It is the most-populous city in the country, with an estimated population of 1.7 million (2012). KL and Selangor together contribute about 40 per cent of the national gross domestic product. The city is a centre for the finance, insurance, real estate, and media industries. The Greater Kuala Lumpur region, also known as the Klang Valley, is an urban agglomeration of 6.3 million (as per the 2010 census). The region comprises KL, Putrajaya, Klang, Kajang, Subang Jaya, Selayang, Shah Alam, Ampang Jaya, and Sepang.

KL is among the fastest growing metropolitan regions in the country in terms of population and economic base. The largest growth has been in the southern and western districts, such as Sepang, Petaling Jaya, and Putrajaya.

Key players: Land Public Transport Commission/ Suruhanjaya Pengangkutan Awam Darat (SPAD) plans, regulates, and enforces all matters related to surface public transport in Peninsular Malaysia.

In August 1997, Express Rail Link Sdn Bhd (ERL) secured the contract to design, finance, construct, operate, and maintain the Kuala Lumpur International Airport (KLIA) Ekspres and KLIA Transit lines for a concession period of 30 years. ERL's shareholders are YTL Corporation Berhad (50 per cent stake), Lembaga Tabung Haji Bhd (40 per cent stake), and Trisilco Equity Sdn Bhd (10 per cent stake).

ERL Maintenance Support Sdn Bhd (E-MAS), a wholly owned subsidiary of ERL established in 1999, is responsible for the operations and maintenance (O&M) of the system. E-MAS was initially owned by Siemens (51 per cent stake) and ERL (49 per cent stake). ERL took over Siemens' shareholding in June 2005.



Airport background: KLIA opened in January 1996. It is the largest airport in the country. It is located approximately 45 km from Kuala Lumpur city centre.

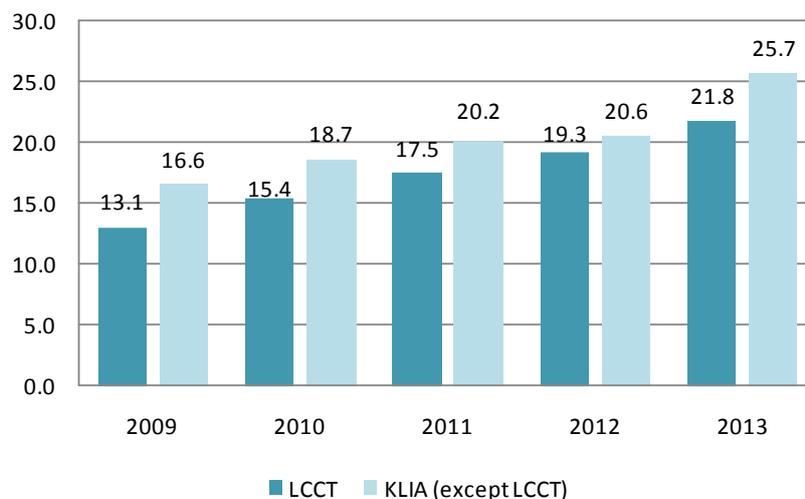
Up to May 2014, KLIA catered to full-service and low-cost carriers. Full-service operations began in 1996 and the low-cost carrier terminal (LCCT) opened in 2006. The LCCT was implemented as a temporary measure aimed at boosting demand from no-frills airline passengers and reached full capacity within two years.

The Kuala Lumpur International Airport 2 (KLIA-2) was commissioned in May 2014 to replace the LCCT. It is the world’s largest low-cost terminal, with a capacity to handle 45 million passengers annually.

KLIA is the fastest growing airport in Asia, recording a year-on-year passenger traffic growth rate of 19 per cent in 2013. Passenger traffic at KLIA (including the LCCT) increased at a compound annual growth rate (CAGR) of 12.46 per cent during 2009–13. The LCCT recorded a CAGR of 13.58 per cent and KLIA (excluding the LCCT) recorded a CAGR of 11.55 per cent during 2009–13.

Figure 2.3.6.1.1 illustrates passenger traffic growth at KLIA during 2008–13.

Figure 2.3.6.1.1: Passenger traffic at KLIA during 2009–13 (million)



Note: LCCT: Low-cost carrier terminal; LCCT operations have shifted to KLIA-2 since May 2014
Source: KLIA

Current rail connectivity: The rail link extends 57 km from KL Sentral to KLIA, and 59.14 km from KL Sentral to KLIA-2. The service from KL Sentral to KLIA commenced in 2002. A 2.14-km extension opened along with KLIA-2 in May 2014.

Table 2.3.6.1.1 indicates the two types of rail services available.



Table 2.3.6.1.1: Types of ERL service

Type of ERL service	Description	Date of commencement of operations	End-to-end journey time	Train frequency*
KLIA Ekspres	Non-stop, direct train service from KL Sentral to KLIA.	April 2002	28 minutes	Every 15 minutes during peak hours and every 20 minutes during non-peak hours; every 30 minutes after midnight
	Direct train service from KL Sentral to KLIA-2 with one stop at KLIA.	May 2014	33 minutes	
KLIA Transit	A transit train which stops at three stations—Bandar Tasik Selatan, Putrajaya/Cyberjaya, and Salak Tinggi—en route to KLIA.	June 2002	36 minutes	Every 20 minutes during peak hours Mondays to Fridays; every 30 minutes during off-peak hours and on weekends
	A transit train which stops at four stations—Bandar Tasik Selatan, Putrajaya/Cyberjaya, Salak Tinggi, and KLIA—en route to KLIA-2.	May 2014	39 minutes	

Notes: Passengers can also take a 3-minute ride between KLIA-2 and KLIA.* Peak hours are from 5.00 a.m. to 9.00 a.m. and from 4.00 p.m. to 10.00 p.m.

Source: ERL

The check-in and ticket counters are located on Level 1 of the KL Sentral complex.

Currently, flight check-in service at KL Sentral is available for passengers flying with Malaysia Airlines, Cathay Pacific Airways, Emirates Airline, Royal Brunei Airlines, and Etihad Airways. The baggage is tagged to the flight destination.

Since there are no check-in facilities at any of the KLIA Transit intermediate stations, KLIA Transit passengers boarding from intermediate stations check in upon arrival at the airport. Passengers avail free porter service on a first-come, first-served basis. The minimum check-in time is 2 hours before the flight departure time (1.5 hours for those without luggage).

For KLIA-2, passengers can check in at the airport only. There is no city centre check-in service at KL Sentral.

Malaysia Airlines has a ticket sales office at KL Sentral.

At KLIA, the ticket counter is located on Level 1. At KLIA-2, the ticket counter is located on Level 2. The train platforms are located on Level 1 at both airports.



The KL Sentral–KLIA link was developed at an investment of MYR2.4 billion. It was financed through equity mergers (MYR500 million), loans from the Development and Infrastructure Bank of Malaysia (MYR940 million), and import credit from four German financial institutions. The extension to KLIA-2 was developed at an investment of MYR100 million and was funded by the government.

Ridership: The average daily ridership is about 19,000 passengers (July 2014).

By September 2005, the rail link had transported 10 million passengers. By 2012, the tenth year of its operations, it had transported over 40 million passengers. In March 2014, it crossed the 50 million passenger mark.

ERL is expecting a 40 per cent increase in ridership following the opening of the extension in May 2014. It is expected to carry 8.4 million passengers in 2014 and 10 million passengers in 2015.

Fare system: One-way and return-trip fares are available for adults and children. Standard-fare tickets are valid for three months. Multi-trip passes are available for frequent travellers.

The one-way fare for KLIA Ekspres from KL Sentral to KLIA, and from KL Sentral to KLIA-2, is MYR35, and the return fare is MYR70. For inter-terminal transfer, the fare is MYR2 per trip.

KLIA Transit offers weekly and monthly TravelCards for frequent travellers. The TravelCard is applicable only between stations encoded on the card. Travel to other stations is possible, but is chargeable at full fare per trip. There is a 30 per cent discount on standard fares for senior citizens, the disabled, and KADS1M card holders. Discounted-fare tickets are available at ticket counters for passengers under special categories.

A cloud-based automated fare collection (AFC) system, the only one of its kind in the world, has been deployed since August 2013. The system offers an end-to-end multi-channel avenue and validation solution that manages ticketing operations across six stations, from KL Sentral to the international airports.

The new system replaces the former magnetic-stripe paper-based ticketing system with a QR barcode ticketing system. Passengers can access one channel to book their complete itinerary and enjoy seamless and faster ticketing service. Upon payment, passengers are provided with a universal ticket that is used throughout the journey. The new gates also accept Touch 'n Go and Visa payWave contactless smart cards, which are used to pay for travel on other public transport systems.

The KLIA Ekspres ticket can be purchased at the KLIA Ekspres ticket counters or at the self-service kiosks at KL Sentral or KLIA. Tickets can also be purchased through mobile phones or online. However, the barcode reader is currently not able to read tickets whose barcodes are displayed on mobile devices, so passengers need to carry a ticket printout to pass through the gate. Payments can be made via Visa and MasterCard credit cards.



UK-based Xchanging and Malaysia-based Longbow Technologies Sdn Bhd have implemented the system, with Malaysia-based Syarikat Pembinaan Yeoh Tiong Lay Sdn Bhd (SPYTL) as the project manager and EON Bank (now part of Hong Leong Bank) as the payment settler.

The system components include the GHL VR300 contactless reader, the VeriFone VX510 TCP/IP capable terminal, YTLE gate systems and controllers, the netAccess L-200 network controller, a reconciliation back-end server.

In September 2013, the provider of Touch 'n Go introduced MYPass, the prepaid and discount flash card for visitors that allows them to pay for products and services wherever the Touch 'n Go sign is displayed. This includes KL's public transport system, retail stores, restaurants, theme parks, and other attractions. The card can be reloaded with fares ranging from a minimum of MYR10 up to a maximum of MYR1,500 at convenience stores, transit stations, petrol stations, and selected retail outlets. The MYPass card also has discount vouchers.

Rolling stock and technology: Currently, ERL operates with 12 train sets – eight for KLIA Ekspres and four for KLIA Transit – supplied by Germany-based Siemens.

Table 2.3.6.1.2 lists the key features of the rolling stock.

Table 2.3.6.1.2: Key features of ERL rolling stock

Parameter	Description
Type of vehicle	Electric train unit Desiro ET
Number of carriages	4
Voltage system (AC kV/Hz)	25/50
Maximum output at the wheel [kW]	1,800
Acceleration (m/s ²)	1.0
Maximum speed (km/hr)	160
Weight (tonnes)	120
Track width (mm)	1,435
Number of seats	156

Source: Siemens

Operating at the top speed of 160 km/hr, the KLIA Ekspres is Southeast Asia's fastest train, with a 99.7 per cent on-time service performance.

The rail link uses the ZSL90 automatic train protection system. In May 2000, Motorola secured a contract from Siemens to install its TETRA-compliant system called Dimetra. This was Asia's first TETRA system for transit rail and the first TETRA system for Malaysia.

Tracks are standard gauge (1,435 mm). Power is sourced from overhead lines (25 kV).

Public outreach: Table 2.3.6.1.3 lists the key initiatives taken by ERL to attract ridership and to promote the use of public transport.



Table 2.3.6.1.3: Key initiatives

Year	Key initiatives
June 2003	<ul style="list-style-type: none"> • Cathay Pacific Airways and Royal Brunei Airlines started offering check-in services at KL CAT and KL Sentral. • ERL started offering the KLIA Transit F1 Transfer Package.
August 2004	<ul style="list-style-type: none"> • The e-XKL service, later rebranded as the KLIA Ekspres VIP Service, was launched as a premium door-to-door airport transfer that combines the KLIA Ekspres and an executive limousine, catering primarily to inbound travellers.
September 2005	<ul style="list-style-type: none"> • ERL received its 10 millionth passenger. The passenger was awarded a business-class return trip to New York City from Kuala Lumpur.
November 2007	<ul style="list-style-type: none"> • Emirates Airline started offering the in-town check-in service at KL Sentral.
December 2007	<ul style="list-style-type: none"> • The 20 millionth passenger milestone was achieved. The passenger was awarded an economy-class ticket to Dubai.
August 2009	<ul style="list-style-type: none"> • ERL launched the GO GREEN, GO LO-CO2 initiative.
September 2009	<ul style="list-style-type: none"> • The KLIA Transit to LCCT service was launched.
June 2010	<ul style="list-style-type: none"> • ERL received its 30 millionth passenger.
July 2010	<ul style="list-style-type: none"> • The KLIA Ekspres VIP Service was extended to cover residential homes for outbound travel.
August 2010	<ul style="list-style-type: none"> • ERL partnered with Visa to introduce a contactless ticket payment facility at KLIA Ekspres gates for payWave card holders.
September 2010	<ul style="list-style-type: none"> • ERL launched its e-ticketing facility, allowing customers to buy the KLIA Ekspres Single Trip ticket online.
November 2010	<ul style="list-style-type: none"> • 4G wifi was made available on board trains.
April 2011	<ul style="list-style-type: none"> • The purchase of the Return Trip fare was made available online. • Earlier services were introduced on KLIA Transit from 4.30 a.m. from KL Sentral to cater to early-morning Air Asia flights.
August 2011	<ul style="list-style-type: none"> • The Touch 'n Go payment facility for KLIA Ekspres went live.
November 2011	<ul style="list-style-type: none"> • ERL received the ISO9001:2008 certification. • New train seat covers and carpets were introduced.
December 2011	<ul style="list-style-type: none"> • Touch 'n Go on KLIA Transit was started.
July 2013	<ul style="list-style-type: none"> • ERL launched its new AFC system, which involved revamping the online ticketing system and introducing the new KLIA Ekspres Mobile App.
November 2013	<ul style="list-style-type: none"> • Etihad Airways launched its in-town check-in service at KL CAT.
March 2014	<ul style="list-style-type: none"> • ERL received its 50 millionth passenger. The passenger was awarded two return Coral Economy Class tickets to any European destination by event partner, Etihad Airways. • The KLIA Transit Petronas Malaysia Grand Prix Transfer Package was launched. It combined a ride on a KLIA Transit train and a shuttle bus to take passengers from KL Sentral station to Sepang International Circuit (venue of the Grand Prix).
May 2014	<ul style="list-style-type: none"> • The first 1,000 passengers to KLIA-2 were given free return tickets for travel from KL Sentral to KLIA-2 on a first-come, first-served basis.

Source: ERL



Key issues: The rail link has several unique features, such as installation of a cloud-based ticketing system and deployment of TETRA technology, which are expected to provide insight for use on other projects. In addition, the government has commissioned KLIA-2 and the ERL extension simultaneously, which is a critical factor in ensuring the success of the air rail link in terms of public acceptance and ridership. Given that KLIA is the fastest-growing airport in Asia (in terms of passenger traffic) currently and since KLIA-2 is the world's largest low-cost terminal, this high demand is expected to result in increased levels of ridership for the ERL, thus further ensuring the success of the system.

Future plans: The upcoming capital-investment opportunities are as follows.

Line extension

ERL has proposed the extension of the rail link to Seremban and Melacca to serve passengers outside KL. The MYR8-billion project will involve the purchase of new train sets, construction of new lines, and installation of the communication and signalling system.

Depending on the route of the alignment, the KLIA–Seremban stretch could be about 45 km long, and the section from Seremban to Malacca could be another 45 km to 55 km in length. Two to four stations have been proposed, including a confirmed stop at Seremban.

With the ERL, travel time from KL to Seremban will be about 50 minutes, and travel time to Malacca will be an additional 30 minutes.

Rolling stock procurement

ERL has unveiled plans to buy an additional four train sets to support operations following the opening of KLIA-2. The contract is expected to be awarded in 2014, and delivery is likely to take place 23 months from the date of award of the contract. The acquisition is expected to be financed through internal funds and bank borrowings.

KL Sentral upgradation

KL Sentral is planned to be upgraded by 2017 at an investment of MYR180 million. The project involves upgradation of escalators, the ventilation system, toilets, the security system and the command centre, the landscape decks, etc.

Recent developments: In May 2014, ERL started commercial train service from all stations to KLIA-2.

In April 2014, ERL offered the public joy rides onboard the KLIA Ekspres from KL Sentral to KLIA-2 in conjunction with the KLIA-2 Open Day. Also, in the same month, ERL stated that it would bid for the Kuala Lumpur–Singapore High-Speed Rail (HSR) project.

In March 2014, ERL's total ridership since its opening in April 2002 crossed the 50 million passenger mark.

(1 MYR [Malaysian Ringgit] = 0.31 USD)

Key contacts:

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- Noormah Mohammad Noor, CEO, ERL
- Mohd Nadzmi bin Mohammad Salleh, Executive Chairman, ERL
- Dave Walsh, General Manager for Malaysia, Etihad Airways
- Muralidharan Nadarajah, CEO, Xchanging Malaysia

