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Detailed Feasibility Study for

Environmentally Friendly Linkage System for Kowloon East

Interim Public Consultation

EFLS Environmentally Friendly Linkage System for Kowloon East

發展局
Development Bureau

CEDD 土木工程拓展署
Civil Engineering and Development Department

ARUP

Your Views are Important

The first stage of the Detailed Feasibility Study has been completed, with **the most suitable transport mode as the EFLS for Kowloon East** being recommended. Public are welcome to express views on the findings and recommendation of the first stage study by 2 July 2017 for us to proceed with the next stage of study.

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"To address the various public concerns raised during the preliminary feasibility study (PFS), a detailed feasibility study (DFS) is being conducted in stages to enhance the connectivity in Kowloon East for its transformation into a new Core Business District."

The Kai Tak Outline Zoning Plan approved in 2007 has incorporated the alignment of an Environmentally Friendly Linkage System (EFLS) running within Kai Tak Development (KTD). The 2011-12 Policy Address announced that Kowloon East (KE), including KTD, Kowloon Bay and Kwun Tong business areas, would be transformed into another Core Business District (CBD) to sustain Hong Kong's long term economic development. To enhance the accessibility of the new CBD, appropriate adjustments were necessary on the proposed EFLS to provide a fast and convenient intra-district connectivity service.

2007

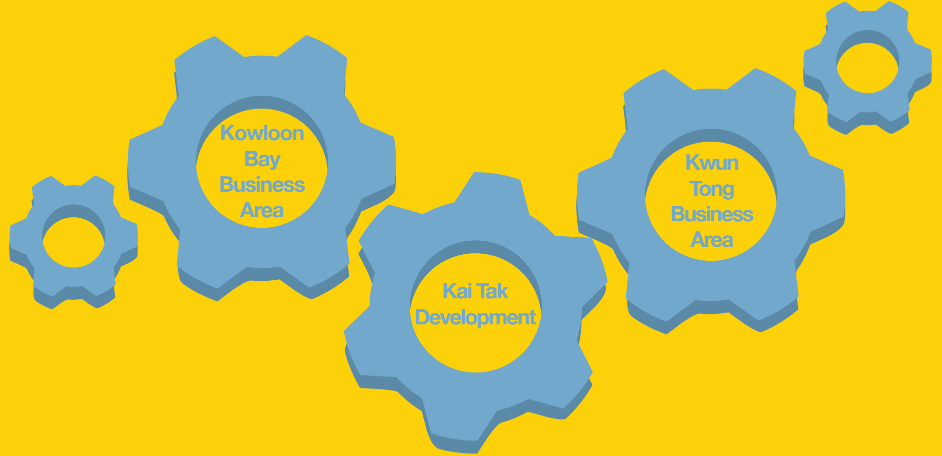
The Kai Tak Outline Zoning Plan incorporated the EFLS running within KTD.

2009

PFS was conducted in December to review the preliminary feasibility of the EFLS.

2011

A 9-km long elevated monorail system with 12 stations was proposed in the PFS, connecting KTD, Kowloon Bay and Kwun Tong business areas.



2012-2014

Public Consultation for PFS

Public generally agreed that there was a need to enhance the connectivity in KE. However, there were diversified views on the proposed elevated monorail system, alignment, coverage and the implications for Kwun Tong Typhoon Shelter.

2015

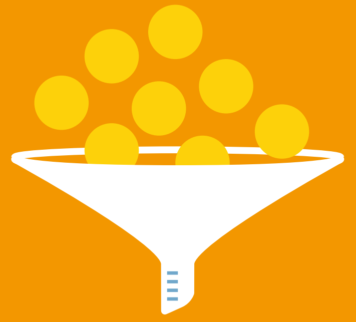
DFS commenced in October. The first stage of the study is to evaluate various green public transport modes and recommend the most suitable mode as EFLS for KE. Further studies on the way forward for the recommended EFLS scheme such as alignment and operation mode will be conducted in the next stage of the DFS.

We are here

2017

The first stage of the DFS was completed. Interim Public Consultation is launched to collect public views on the recommended most suitable transport mode as EFLS for KE.

Evaluate various green public transport modes



Identify the most suitable green public transport mode

Next stage study

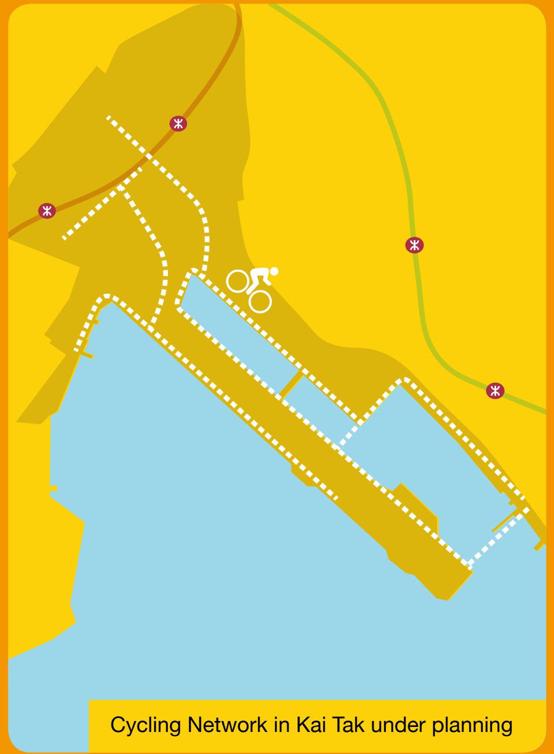
Alignment design, station locations, operation and procurement approaches, etc. will be formulated. Another public consultation will be conducted.

“ KE is a diversified community under rapid development. There are frequent activities in the industrial and commercial areas of Kowloon Bay and Kwun Tong districts. With lots of commercial buildings located alongside the existing roads, traffic in the area is heavy; and there is room to improve the pedestrian walking environment. In KTD, apart from spacious walking environment, the development is interconnected by about 100 hectares of open space which is equipped with a cycling network. ”

Wai Yip Street, Kwun Tong

Kwun Tong Road, Kowloon Bay

Muk Chui Street, Kai Tak



Cycling Network in Kai Tak under planning

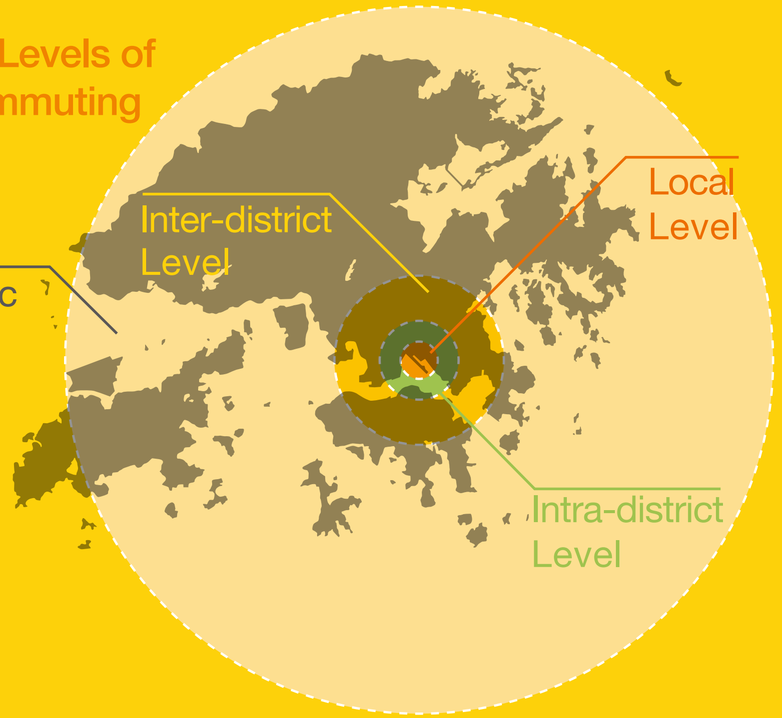
How Ming Street, Kwun Tong

Kai Cheung Road, Kowloon Bay

The existing public transport facilities, including MTR, buses, minibuses, taxis and pedestrian networks, in KE collectively make up the integrated multi-modal linkage system. These facilities are serving our daily transport needs at different levels, i.e. from local and intra- and inter-district commuting to leisure activities on weekends.

As KE is transforming into a CBD, the initial transport demand could be met by conventional road-based transport services and the enhanced pedestrian facilities. In the long run, the Shatin to Central Link under construction and the planned Route 6 could handle the inter-district transport demand. However, due to the limited road space in KE, solely relying on existing public transport services would be difficult to maintain a good quality of service to cope with the traffic growth generated by new developments. Therefore, there is a need to introduce EFLS as an additional transport mode to deal with the rising demand and to enhance the connectivity in KE.

Different Levels of Daily Commuting



Local Level

Activities within walking distance or connectivity with transport interchanges

Example: Walking from home to nearby shopping malls

Intra-district Level

Connectivity between the key activity nodes within KE

Example: From Kai Tak residential areas to the hospital, travelling between Kowloon Bay and Kwun Tong action areas

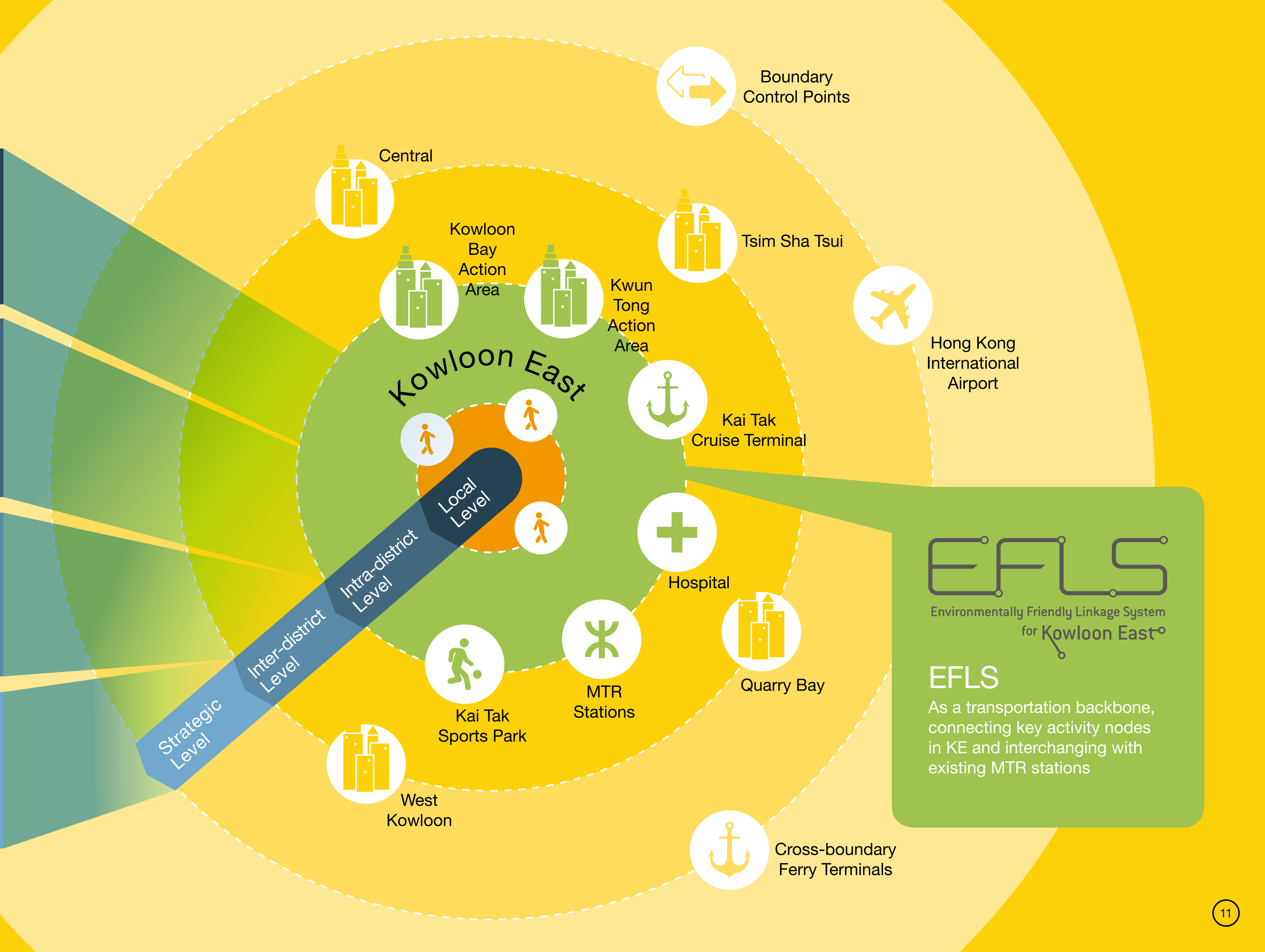
Inter-district Level

Connectivity between KE and other districts to facilitate commuting among different business areas

Example: Trips between Kai Tak and Quarry Bay, Tsim Sha Tsui as well as Central

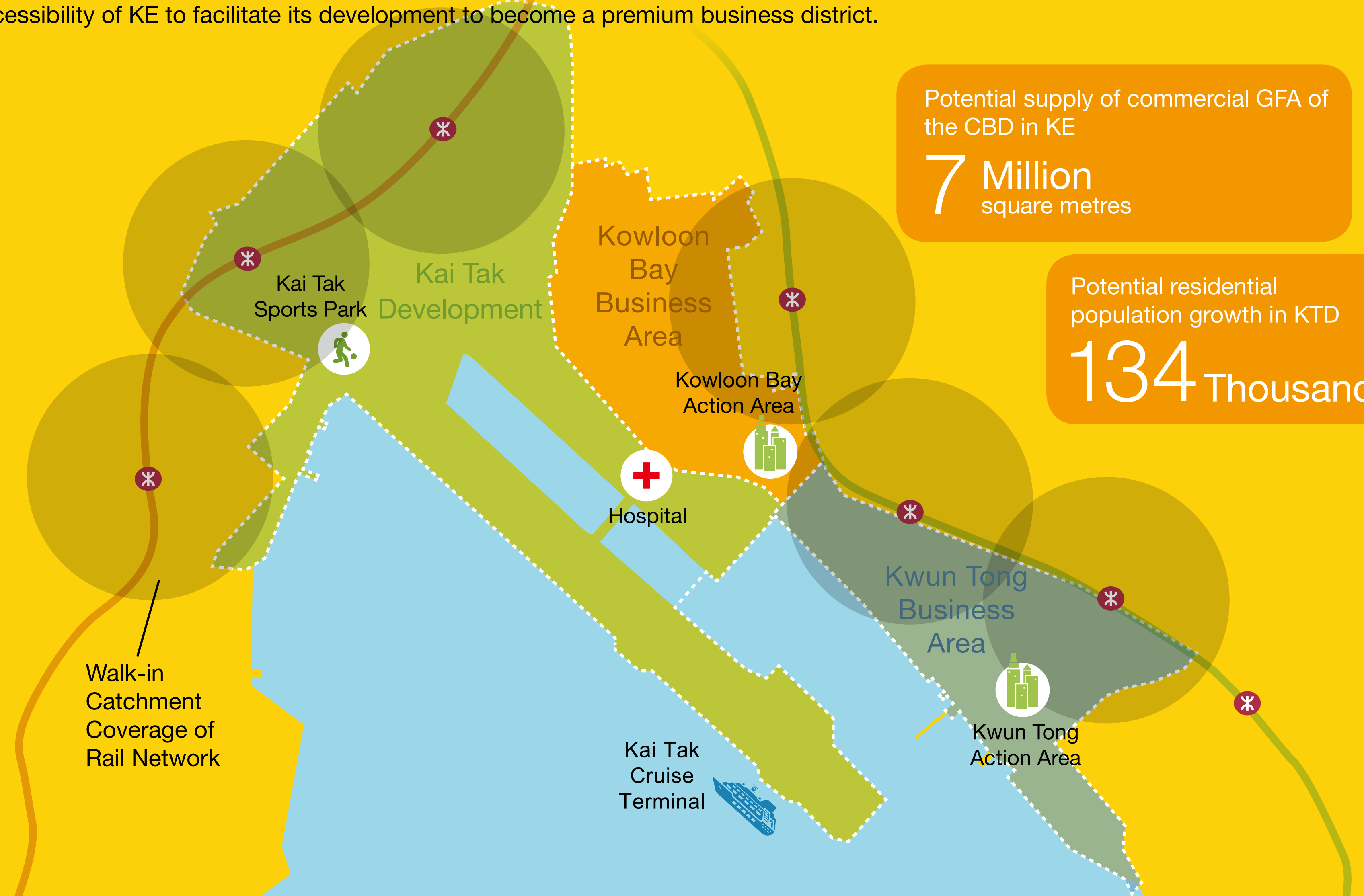
Strategic Level

Connectivity with strategic link roads, airport and cross-boundary facilities to facilitate cross-boundary commercial or travelling needs



Why is there a need for EFLS?

KE as a CBD has the potential to provide about 7 million square metres of commercial gross floor area (GFA) with an upsurge of employment population. The population in KTD will also increase to about 134 thousand. Coupled with the attraction of various public facilities in the district, inevitably there is a growth in transport demand. By 2036, the daily passenger trips are forecast to increase by more than one fold. However, the rail networks only run along the periphery of KE, leaving a large part of the area to be served only by road-based transport services. Kai Tak, formerly a restricted airport area, is relatively distant from the rail networks and major roads. With the introduction of an EFLS linking up the key activity nodes within KE and connecting with rail stations and nearby public transport and pedestrian facilities, it can meet the newly generated traffic need with enhanced road environment, and also can improve the accessibility of KE to facilitate its development to become a premium business district.



Potential supply of commercial GFA of the CBD in KE

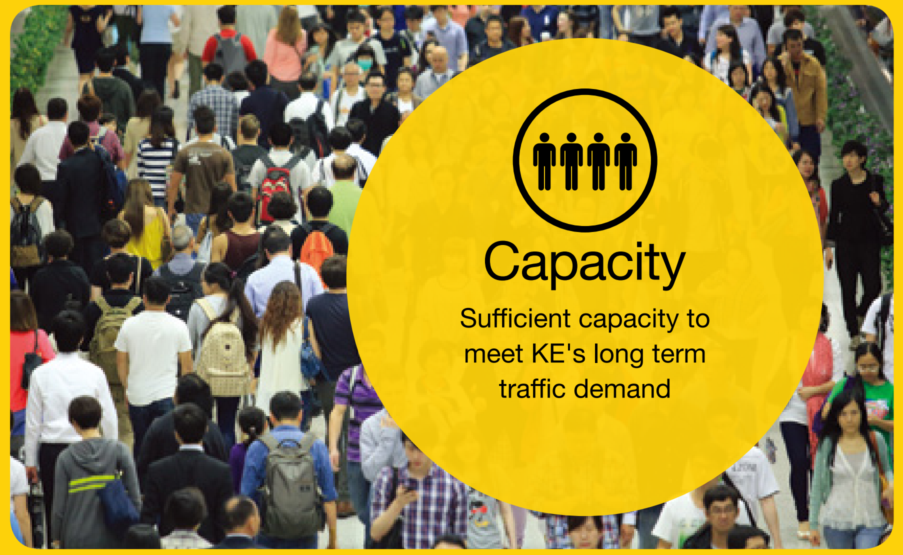
7 Million square metres

Potential residential population growth in KTD

134 Thousand

Visionary Criteria of EFLS for KE

The EFLS should have sufficient capacity to meet future traffic demand in KE. It should also be reliable, comfortable, and on-time so as to provide a quick and time-saving service as compared with other public transport systems. Being a green transport mode, it has to be environmentally and socially sustainable with minimal impact during both construction and operation stages.



"We will evaluate the various green public transport modes against the criteria including capacity, efficiency, reliability and sustainability in order to recommend the most suitable one. Among the various green public transport modes, some of them are obviously not able to meet the criteria, while the rest will be taken forward for further assessment in detail."

Visionary Criteria for EFLS

Please visit the project website for more information about various green transport modes.

Based on the criteria of capacity, efficiency, reliability and sustainability, PRT, cable car, cable-liner and travellator are considered not suitable as EFLS for KE.

Personal Rapid Transit (PRT)

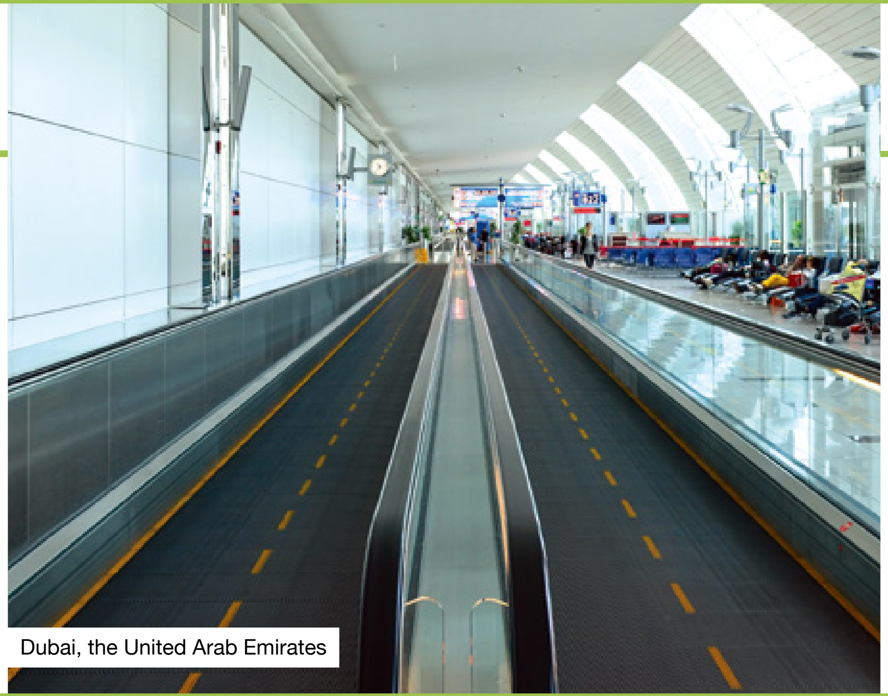
PRT runs on a dedicated corridor. Each vehicle can only accommodate 4 to 6 passengers, with a capacity comparable to a taxi. PRT typically provides on-demand service and is not commonly adopted as a public transport service on public roads. Application example includes the system at Heathrow Airport in London, the United Kingdom.

London, the United Kingdom

Lower capacity

Travellator

Travellator usually serves as a supplementary pedestrian facility to shorten walking time under a better walking environment. It operates at a slow speed and serves short distance trips. Service suspension period for maintenance is relatively long. Examples include the travellators in the Hong Kong International Airport.



Dubai, the United Arab Emirates

Slow and for short-distance service

Long suspension period for maintenance

Cable Car

Cable car is pulled by overhead cables, and operates at a slower speed with low carrying capacity. It is usually used for tourism or recreational purposes instead of serving as daily public transport. Its operation is subject to weather conditions with relatively long service suspension periods for maintenance. Examples include Ngong Ping 360, Cable Car at Ocean Park, Hong Kong and cable car system across the Thames in London, the United Kingdom.

River Thames, the United Kingdom

Service subject to weather conditions and long suspension period for maintenance

Slow

Lower capacity

Cable-liner

Cable-liner is pulled by cable wires and operates on a dedicated corridor with less flexibility in service. Service suspension-time during maintenance can be relatively long. Example includes system in Oakland, USA.

Oakland, the United States of America

Lower flexibility in service

The performance of MT, BRT, Monorail and APM in terms of capacity, efficiency, reliability and sustainability have to be further evaluated in detail for comparison.

Bus Rapid Transit (BRT)

BRT is considered as an upgraded version of a conventional bus system, running on a dedicated corridor featuring designated stations and platform gates. Passengers pay fares before boarding, saving boarding time at the station. However, BRT is manually operated by a driver and shares the same road space at junctions with other road transport. Its travelling time is affected by road traffic. Examples include systems in Seoul in South Korea, Nagoya in Japan and Rio de Janeiro in Brazil.


Rio De Janeiro, Brazil

Monorail

Monorail operates on an elevated dedicated corridor under a fully automated system and is not affected by road traffic , offering a reliable and on-time service. Monorail is commonly adopted as daily public transport system in many cities such as Tokyo in Japan, Daegu in South Korea, Chongqing in China, Dubai in the United Arab Emirates and Sao Paulo in Brazil.


Dubai, the United Arab Emirates

Modern Tramway (MT)

MT operates similar to the Light Rail (LR) in the New Territories West. The system runs on either dedicated or shared road corridor. It is manually operated by a driver and shares the same road space at junctions with other road transport. Its travelling time is affected by road traffic. The low-floor design feature of MT facilitates easier boarding of passengers. It is widely used for commuting in many cities such as Barcelona in Spain and Brittany in France.


Brittany, France

Automated People Mover (APM)

APM operates on an elevated dedicated corridor under a fully automated system, similar to monorail. Its service is not affected by road traffic, offering a reliable and on-time service. Examples include the APM at Hong Kong International Airport and "Yurikamome" in Tokyo, Japan and the Punggol / Sengkang system in Singapore.


Tokyo, Japan

At-grade (dedicated), at-grade (shared) or elevated

Among the four transport modes for further evaluation in detail, both BRT and MT mainly operate at-grade. BRT operates on a dedicated corridor, which gives it a distinct performance advantage over conventional buses. MT operates at-grade either on a dedicated or shared corridor.

Monorail and APM are essentially elevated systems, and they operate on a dedicated corridor on viaducts.

As far as the CBD in KE is concerned, will elevated, at-grade (dedicated) or at-grade (shared) be the most suitable mode for KE?

We will further assess their impacts taking into account the conditions of the area, including traffic, spatial provision and existing facilities, etc. in formulating a recommended proposal.

At-grade (dedicated)

Benefits

- Utilise existing road space, eliminating the need to construct a viaduct
- Low-floor design, with stations at ground-level, convenient for boarding and alighting
- Less visual impact

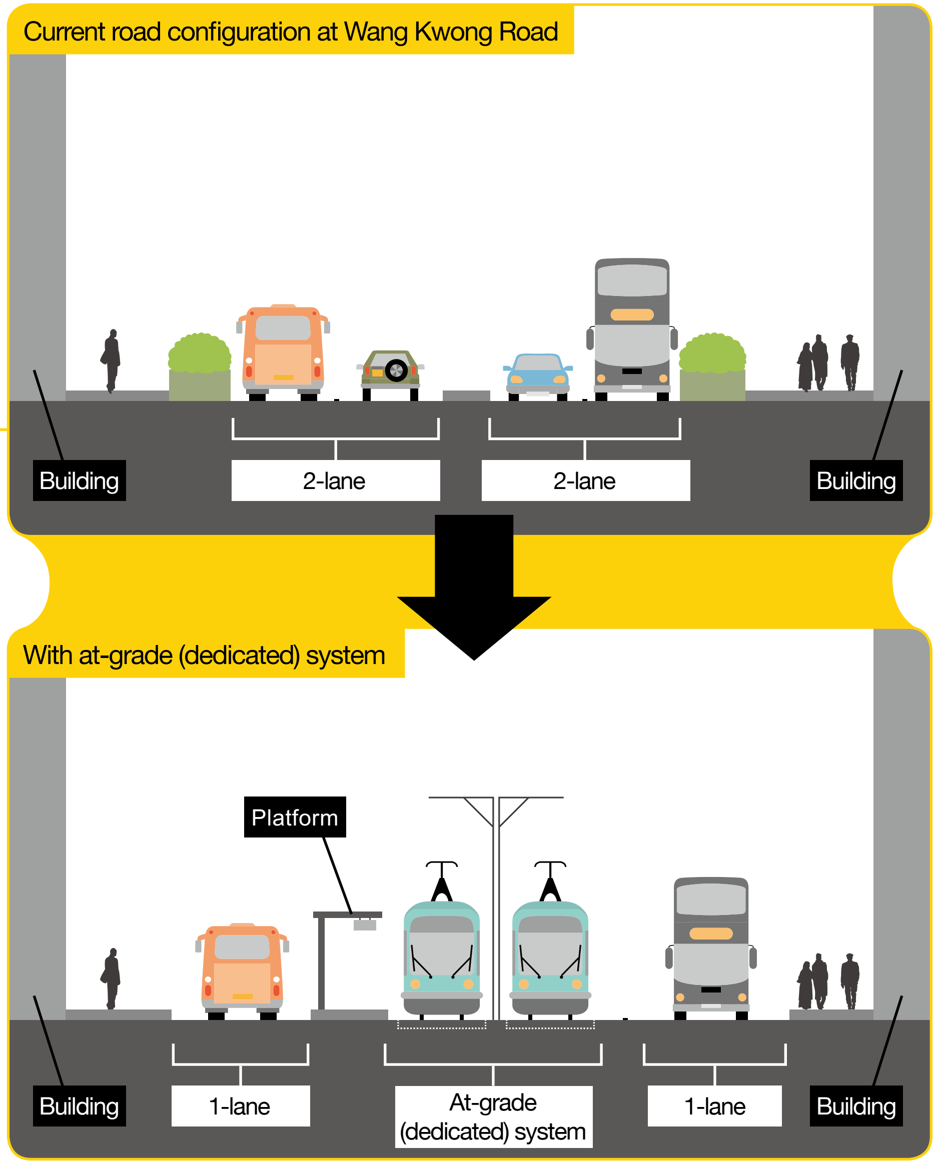
Limitations

Cost factor

- System operated by drivers
- Need to completely relocate underground utilities underneath the dedicated corridor, thus increasing the construction cost and time
- Large-scale modification to all junctions, traffic lights and pedestrian crossing facilities along the corridor

Traffic impact

- At least one traffic lane per direction will be occupied, with more space needed at station locations; other road users cannot enter the dedicated corridor; the condition will be similar to that of the existing Light Rail at the New Territories West
- Priority given to the system at junctions for operational efficiency, thus increasing waiting time for other road users
- Additional pedestrian crossing facilities at station locations may cause impact to other road users



Evaluation Result

- With the at-grade (dedicated) system, the number of existing traffic lanes would be reduced causing traffic congestion, thus resulting in longer travelling time for other road users. The reduced travelling speed of other vehicles would be comparable to walking speed. Given the considerable traffic impact in KE in general, the system would not bring positive economic benefit to society.

This option is considered not suitable.

Streets and roads in red patches indicate traffic congestion. Travelling speed of vehicles is anticipated to be similar to walking speed.

At-grade (shared)

Benefits

- No dedicated corridor, thus the number of traffic lanes generally not affected except at station areas
- Low-floor design, with stations at ground-level, convenient for boarding and alighting
- Less visual impact

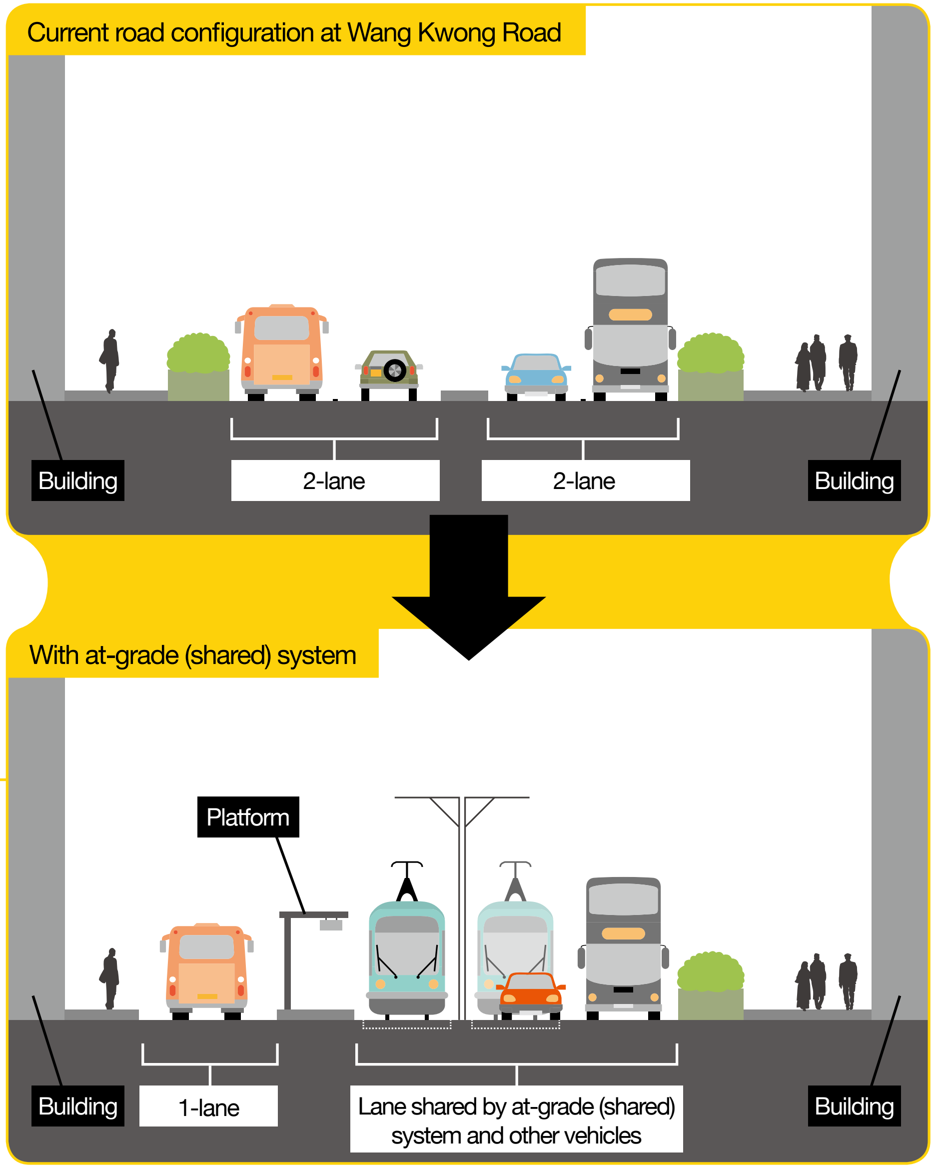
Limitations

Cost factor

- System operated by drivers
- Need to completely relocate underground utilities along the alignment, thus increasing the construction cost and time
- Additional pedestrian crossing facilities at station locations

Traffic impact

- The main corridor will be shared use with other vehicles, except at station areas being dedicated for system, the condition will be similar to the shared section of the existing Light Rail in the New Territories West
- Restricted by general road traffic condition, no apparent advantages in efficiency as the system will operate at speeds comparable to that of other vehicles
- Additional pedestrian crossing facilities at station locations may cause impact to other road users



Shared section of the Light Rail in the New Territories West

Evaluation Result

- The at-grade (shared) system would be subject to traffic conditions. If there is traffic congestion, the EFLS travel time would be prolonged and its service would be affected and delayed, making its operation comparable to other road-based public transport services. Due to additional capital cost of the system, it would not bring positive economic benefit to society. **This option is considered not suitable.**

Elevated

Benefits

- Viaduct columns to be constructed at the central divider of carriageway, occupying less road space
- Less impact on underground utilities
- Operates on dedicated elevated track, leading to a safe and fast service with reduced travelling time
- Not affected by road traffic, with a reliable and on-time service
- Fully automated system without drivers

Limitations

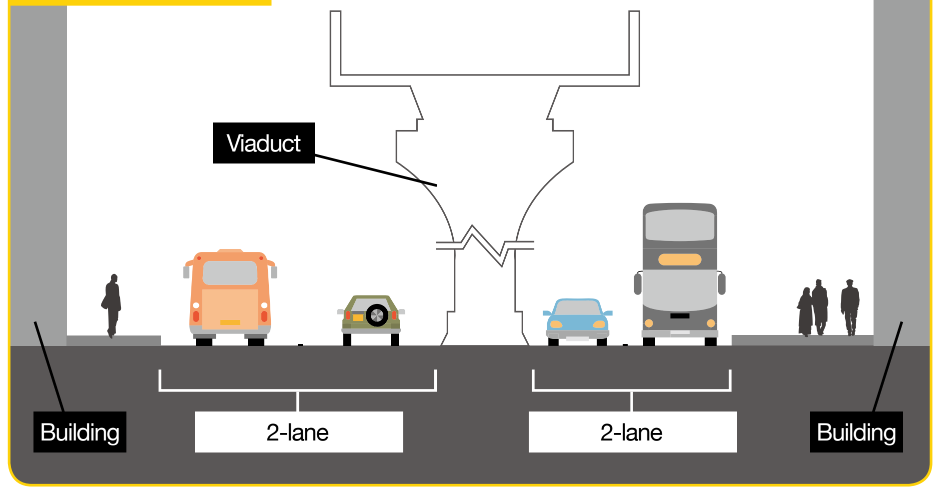
Cost factor

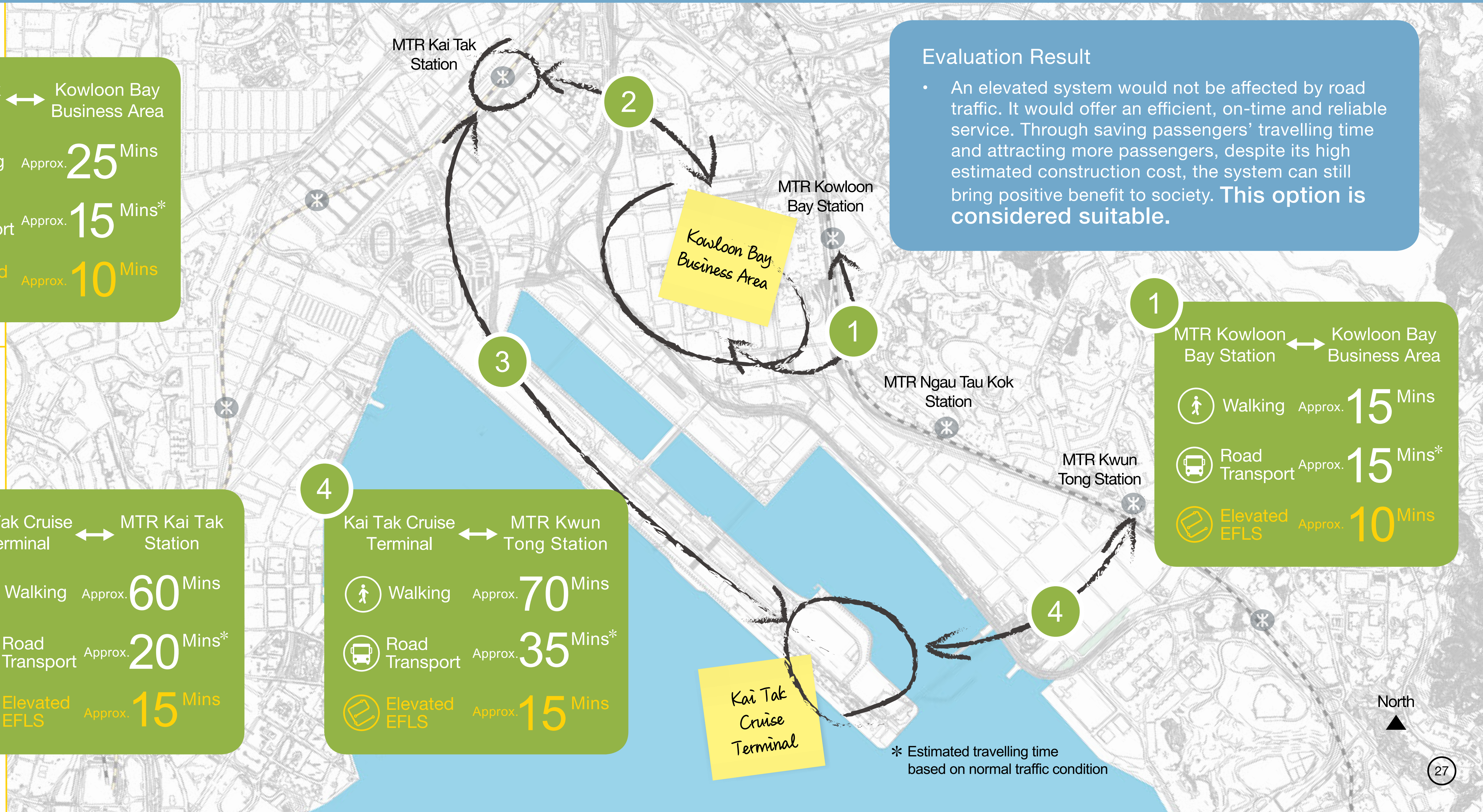
- Operates on viaduct, higher construction cost
- Some sections of carriageway and adjacent footpaths will need to be narrowed or adjusted to make room for the viaduct columns

Environmental factor

- May have visual impact

With elevated system





2 MTR Kai Tak Station ↔ Kowloon Bay Business Area

Walking	Approx. 25 Mins
Road Transport	Approx. 15 Mins*
Elevated EFLS	Approx. 10 Mins

3 Kai Tak Cruise Terminal ↔ MTR Kai Tak Station

Walking	Approx. 60 Mins
Road Transport	Approx. 20 Mins*
Elevated EFLS	Approx. 15 Mins

4 Kai Tak Cruise Terminal ↔ MTR Kwun Tong Station

Walking	Approx. 70 Mins
Road Transport	Approx. 35 Mins*
Elevated EFLS	Approx. 15 Mins

1 MTR Kowloon Bay Station ↔ Kowloon Bay Business Area

Walking	Approx. 15 Mins
Road Transport	Approx. 15 Mins*
Elevated EFLS	Approx. 10 Mins

Evaluation Result

- An elevated system would not be affected by road traffic. It would offer an efficient, on-time and reliable service. Through saving passengers' travelling time and attracting more passengers, despite its high estimated construction cost, the system can still bring positive benefit to society. **This option is considered suitable.**

* Estimated travelling time based on normal traffic condition

Items for Detailed Assessment	Occupation of Existing Road Space	Impact on Underground Utilities	Modifications of Junctions, Traffic Signals and Pedestrian Facilities	Construction Cost	Travelling Time of All Passengers	Visual Impact	Overall Benefit
At-grade (dedicated)	Considerable	Extensive	Large-scale	Low	Lengthened	Minor	Negative
At-grade (shared)	Moderate	Extensive	Localised	Low	Generally no change	Minor	Negative
Elevated	Moderate	Localised	Minor	High	Shortened	Considerable	Positive

Evaluation Conclusion

Elevated system is the most suitable transport mode

Considering the conditions in KE, at-grade (dedicated) or at-grade (shared) systems will cause larger impacts to other road users and cannot bring any positive benefit to society. On the other hand, the performance of an elevated system will not be affected by road traffic. It occupies less road space with much less impact on the existing carriageways and footpaths. An elevated system can also fully leverage its speed and efficiency, shortening travelling time and bringing time-saving benefit to passengers. Passengers can then conveniently and quickly commute among the activity nodes in the district and interchange with the MTR system. To meet the needs of a CBD, an elevated system performs better and is considered as the most suitable transport mode as EFLS for KE.

Elevated Green Public Transport Mode

4 Way Forward

This interim public consultation is to seek public views on adopting an elevated mode EFLS. In the next stage of the DFS, we will examine in detail with regard to the alignment options, station locations and connections, future extension, depot location and layout, operation and procurement approaches, cost and financial analysis, etc. under the elevated mode.

EFLS
Environmentally Friendly Linkage System for Kowloon East

Elevated Green Public Transport Mode

Monorail

Automated People Mover (APM)

Alignment study

Once the elevated mode is ascertained, we will examine the feasibility of the various alignment options based on the structural dimensions and design constraints of different elevated systems. Cost assessment, patronage and journey time will also be collectively evaluated in detail to identify the best performing alignment option.

To construct an elevated structure within a crowded environment, it is necessary to fulfil the requirements of emergency vehicle access to enable passage of emergency vehicles after construction is complete.

Station locations and connections

The location and layout of stations are subject to various factors such as the scale of the EFLS and the platform design. The connectivity of stations with nearby developments will also be explored to facilitate passenger flow and enhance efficiency.

Future extension design

The feasibility of future extensions will be reviewed in the next stage of study to make possible provisions for future expansion.

Locations and layout of depot

The required depot size is different for APM and monorail. We have to examine the spatial requirements for a depot and identify a suitable location for the EFLS in the dense environment of KE.

Cost and financial analysis

Based on the detailed design of alignments, stations and depots, we will estimate the construction, operation and maintenance costs, and evaluate the economic and financial performance of the system. The procurement approach and implementation programme will also be studied.

Operation plan

EFLS is different from existing rail systems in Hong Kong. We will need to formulate a management, operation and maintenance strategy based on the adopted transport mode, and to review the ordinance and regulation arrangement for the EFLS.

Procurement approach

There are various approaches for procuring large scale infrastructure works, such as a conventional Public Works Programme approach or Public-Private Partnership with different conditions on construction, operation, ownership and transfer, etc. We need to examine the pros and cons of different approaches and recommend a suitable arrangement.

Kwun Tong Transportation Link (KTTL)

When examining the alignment options, we will look into details of the proposed KTTL and its possible impact on the Kwun Tong Typhoon Shelter. We need to make sure that any proposal will fully comply with the requirements of the Protection of the Harbour Ordinance.

You are cordially invited to participate in the public consultation activities and express your views by 2 July 2017 via mail, fax, e-mail or phone. Please specify "Detailed Feasibility Study for Environmentally Friendly Linkage System for Kowloon East - Interim Public Consultation".

Public Forum

27 May 2017 (Saturday)
2 – 4 pm

Kai Tak Community Hall
3 Concorde Road, Kai Tak, Kowloon

Please make reservations by 25 May 2017 either by phone at 2268 3781 or by completing the registration form on the project website.

Public may also refer to the transportation routes to Trade and Industry Tower and then walk to Kai Tak Community Hall.

Disclaimer: A person or an organisation providing any comments and suggestions to the Civil Engineering and Development Department on the "Detailed Feasibility Study for Environmentally Friendly Linkage System for Kowloon East "shall be deemed to have given consent to the Civil Engineering and Development Department to partially or wholly publish the comments and suggestions (including the names of the individuals and organisations), while contact information such as telephone numbers or email addresses will be kept confidential. If you do not agree to this arrangement, please state so when providing comments and suggestions.

My View

The Interim Public Consultation of the DFS for EFLS for Kowloon East has been launched with the most suitable transport mode as EFLS for Kowloon East being recommended. You are cordially invited to express your views on the findings and recommendation of the first stage study by 2 July 2017 via mail, fax, e-mail or phone.

Name ______________________ Organisation ______________________

Telephone ______________________ E-mail ______________________

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啟德 KAI TAK

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Roving Exhibition

9 - 12 May
Central Theatre, Kai Ching Estate

15 - 26 May
Trade and Industry Tower

27 May - 9 June
Kwun Tong Promenade

10 - 21 June
Revenue Tower, Wan Chai

22 June - 2 July
North Point Government Offices

The schedule for the roving exhibition may be changed.
Please visit the project website for the latest arrangement.

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