

HONG KONG TRANSPORT OPERATIONS



Composite photograph at Kai Tak Station

45% Fewer
Reportable
Events

99.9%
Passenger Journeys
On-time

3.88 million
Average Weekday
Patronage

AIM

We strive to be an internationally-recognised company that connects and grows communities with caring, innovative and sustainable services. We also seek to generate returns that enable us to invest in our world-class rail network, further improve our high levels of service, and continue meeting the ever-changing needs and expectations of our customers. These investments involve upgrading and replacing our existing railway assets, as well as constructing new railway lines that reduce travel times and bring communities closer together – enabling us to develop networks that support Hong Kong’s future growth as an economy and a society.

CHALLENGES

- Maintaining high levels of health, safety and reliability during the COVID-19 pandemic
- Patronage affected by social restrictions, work-from-home arrangements and border closures
- Managing major asset upgrades and replacements without compromising our safety and service performance or the customer experience

STRATEGIES

- Adjust and optimise train services, apply cost control measures, and employ further smart operating, smart maintenance and automation initiatives with a customer centric mindset to alleviate the impact of reduced patronage due to COVID-19

- Intensify cleaning and sanitisation procedures and introduce leading-edge technologies to ensure station and train cleanliness. Manufacture and provide personal protective equipment for the health and safety of our staff and customers
- Launch promotions that encourage travel during non-peak hours and promote domestic leisure travel via MTR. Leverage MTR Mobile to encourage usage of our services
- Maintain high performance standards that exceed the targets set out in the Operating Agreement and our own even more demanding Customer Service Pledges. Continue our stringent maintenance regime and invest significantly in renewing and upgrading our railway assets
- Leverage our strong culture of safety to deliver operational excellence. Equip staff with clear guidelines and sound training in operations and customer service, and raise public awareness of rail safety through targeted campaigns and information
- Integrate innovation and technology into our operations to drive customer service excellence and fuel future growth
- Work to digitise our own internal processes, enhancing the customer experience and optimising operations and workflow

OUTLOOK

The COVID-19 pandemic could have profound long-term effects in terms of how customer behave. Travel restrictions and boundary closures have led to an almost complete halt to Hong Kong visitation by travellers from the Mainland of China and overseas, dramatically impacting our Airport Express and High Speed Rail (“HSR”) patronage. Domestic patronage for our heavy and light rail networks has decreased due to quarantine measures, work- and study-from-home arrangements, and lower in-store spending by shoppers. These conditions are expected to continue to varying degrees well into 2021.

As one of the leading operators in the railway business, we will continue to do our utmost to ensure that our stations, trains and facilities meet the highest standards of cleanliness and sanitisation, thereby providing peace of mind during passenger journeys. We will also keep striving for excellence in service reliability and safety, maintaining world-class operational standards as we move closer to the full line opening of the Tuen Ma Line.

Our Corporate Strategy outlines the way forward for MTR and its transport operations. We will seek to achieve sustainable business results by adhering to strong environmental, social and governance principles that foster mutually beneficial growth in our communities. In 2021, this will include driving patronage by reviewing our scheduling and fares while remaining sensitive to the latest Government guidelines and prevailing economic conditions. MTR Mobile will enhance the customer experience by making it easier to plan trips. As always, providing comfortable, caring and inclusive customer service will remain a key focus.



SAFETY

Safety is always our highest priority. This year there was a 45% decrease in reportable events compared to the same period in 2019. The number of reportable events per million passengers carried on our heavy rail and light rail networks continued to improve, falling to 0.58 in 2020. While we achieved solid passenger safety performance in 2020, it must be noted that the number of reportable events in the previous year was skewed by the public order events. Further details about our safety performance can be found in the Ten-Year Statistics of this Annual Report.

The Escalator Safety Special Task Force continued to organise programmes following accidents to help prevent similar occurrences in future. The Task Force also took a number of proactive measures to educate the public on the importance of escalator safety, setting up Escalator Safety Promotion Booths at various stations and organising Escalator Safety Walks throughout the year. May saw the launch of the Escalator Safety Campaign

2020 featuring MTR Ambassador T Chai. In addition, new safety labels were placed on all escalators in Kowloon Bay, Nam Cheong and Causeway Bay stations on a trial basis.

The Platform Gap Incident Special Task Force made a number of site visits throughout the year to identify improvement opportunities and platform gap incident control measures. In addition to the various measures we already have in place to raise passenger awareness, we also held an internal promotional campaign during the year to convey the importance of the issue to staff and encourage them to proactively remind passengers.

To enhance safety in our Light Rail operations, we installed smart flashing bollards with highly visible flashing yellow strips at pedestrian crossings at two Light Rail locations. We implemented our innovative Integrated Speed and Position Supervision System, which helps improve operational safety and efficiency by monitoring light rail vehicle speed in real time.

PATRONAGE AND REVENUE

	Patronage in millions		Revenue HK\$ million	
	2020	Inc./(Dec.) %	2020	Inc./(Dec.) %
Hong Kong Transport Operations				
Domestic Service	1,145.0	(27.0)	9,229	(27.4)
Cross-boundary Service	7.6	(92.7)	516	(83.7)
High Speed Rail ("HSR")	1.0	(93.9)	1,277	(39.1)
Airport Express	3.1	(80.5)	140	(86.2)
Light Rail and Bus	154.0	(25.8)	481	(29.0)
Intercity	0.1	(94.5)	20	(88.6)
	1,310.8	(31.5)	11,663	(41.2)
Others			233	135.4
Total			11,896	(40.3)

Total patronage for all our rail and bus passenger services in 2020 decreased by 31.5% to 1,310.8 million passenger trips. This was attributed to the COVID-19 pandemic and its effects on both the domestic and tourist markets, which were negatively impacted by anti-pandemic measures, cross-boundary service closures, international travel restrictions and overall economic decline.

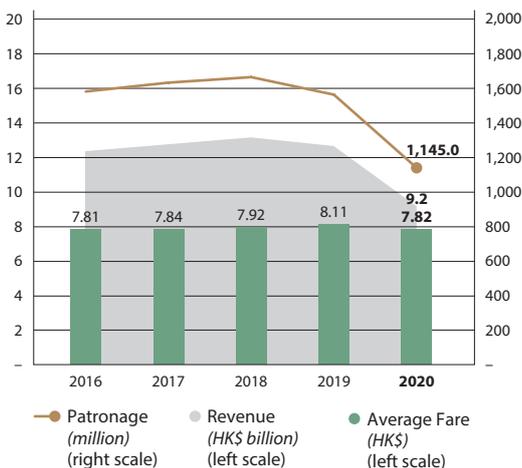
Our Domestic Service (comprising the Kwun Tong, Tsuen Wan, Island, Tung Chung, Tseung Kwan O, Disneyland Resort, East Rail (excluding the Cross-boundary Service), West Rail and South Island lines as well as Tuen Ma Line Phase 1) recorded total patronage of 1,145.0 million in 2020, which was 27.0% lower than the previous year.

Patronage for the Cross-boundary Service to Lo Wu and Lok Ma Chau decreased by 92.7% to 7.6 million. This was attributed to the drastic reduction in travellers from the Mainland of China following the COVID-19 outbreak and subsequent boundary closure. HSR patronage was 1.0 million, a 93.9% decrease compared to 2019. Airport Express patronage decreased by 80.5% to 3.1 million as a result of the steep drop-off in air travellers.

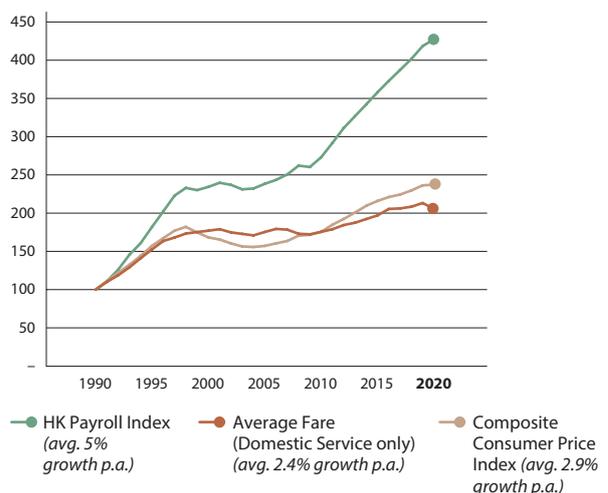
Average weekday patronage for all our rail and bus passenger services decreased by 30.9% to 3.88 million passenger trips. Our Domestic Service saw a 26.9% decrease to 3.41 million.

To stimulate ridership in response to the challenges posed by the COVID-19 pandemic, we have been launching promotions such as the Early Bird Discount to promote non-peak travel. We have also been creating attractive fare, ticket and pass promotions, such as a 20% rebate on Octopus trips and HK\$100 discounts on MTR City Saver and Monthly Pass Extras. We are leveraging our constantly evolving MTR Mobile to deliver these attractive promotions and other information to users. More than ever, we have been regularly reviewing our train schedules to account for demand fluctuations and ensure customer convenience. We are also seeking to promote MTR to domestic users as the preferred transit method for exploring the numerous travel and sightseeing opportunities within Hong Kong.

Domestic Service – Patronage and Average Fare



Fare Trend



MARKET SHARE

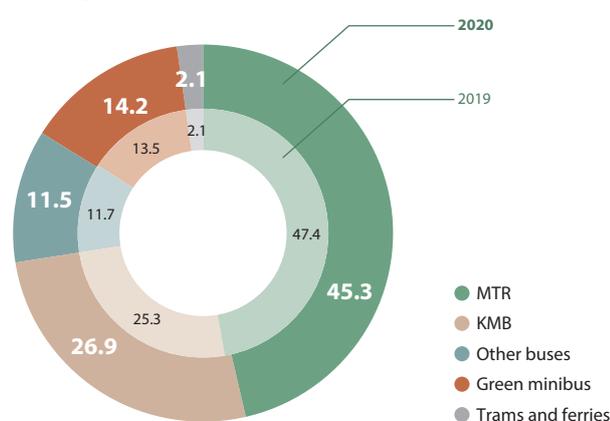
Our overall share of the franchised public transport market in Hong Kong was 45.3% compared to 47.4% in 2019. This decline was mainly due to the precipitous drop in patronage owing to the COVID-19 pandemic for Cross-boundary Service, HSR and Airport Express, in which we have a relatively higher market share than other

franchised transport operators. Our share of cross-harbour traffic was 66.1% against the 67.5% recorded in 2019.

In 2020, our Cross-boundary and HSR service registered a decrease in market share of cross-boundary business to 47.2% from 51.3%. Our market share to and from the airport decreased to 16.3% from 20.5%.

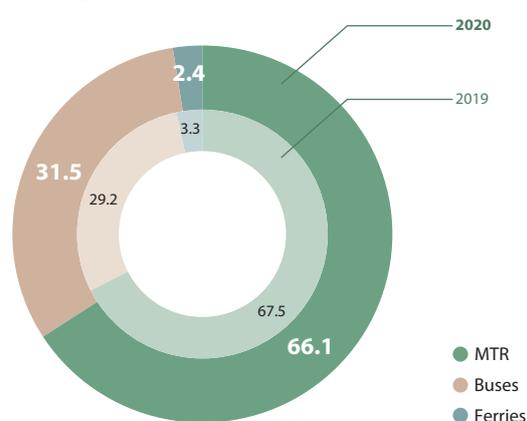
Market Shares of Major Transport Operators in Hong Kong

(Percentage)



Market Shares of Major Transport Operators Crossing the Harbour

(Percentage)



FARE ADJUSTMENTS, PROMOTIONS AND CONCESSIONS

In accordance with the Fare Adjustment Mechanism ("FAM"), the overall adjustment rate of MTR fares for 2019/2020 was +3.3%. However, MTR introduced a 3.3% rebate for every Octopus trip valid from 30 June 2019 to 4 April 2020, meaning passengers using Octopus effectively paid no actual fare increase. The +0.3% fare adjustment for the announced 2019/2020 FAM that was not implemented may also be recouped in 2021/2022, subject to the provisions of the FAM.

In March 2020, we announced the fare adjustment rate for 2020/2021 is +2.55% according to the FAM. In view of the Affordability Cap owing to the negative growth of Median Monthly Household Income, there is no fare increase for 2020, and +2.55% may be recouped over the subsequent two years, with +1.28% to be recouped in 2021/2022 and +1.27% to be recouped in 2022/2023. Such recoupments will be made subject to the provisions of the FAM.

We also announced in March 2020 an extension of the 3.3% rebate to 1 January 2021 as part of a promotional

package for 2020/2021. Other promotions included setting no price adjustment for the MTR City Saver and Tuen Mun-Nam Cheong Day Pass until 1 January 2021; setting no price adjustment for Monthly Pass Extras until December 2020 (which, as announced in November 2020, was further extended to June 2021); and extending the Early Bird Discount Promotion until 31 May 2021. In 2020, we offered HK\$1.7 billion in on-going fare concessions to the elderly, children, students and persons with disabilities.

In April 2020, MTR announced a six-month package of one-off relief measures, effective 1 July 2020 to 1 January 2021, to help people across the city deal with the adverse economic effects of COVID-19. These included a 20% rebate on every Octopus trip, a substantial increase over the 3.3% rebate previously being offered. Other relief measures included a HK\$100 discount on MTR City Saver and a HK\$100 discount on Monthly Pass Extras (from July

to December 2020). Following the announcement of the extension of these relief measures in November 2020, the 20% rebate will be effective till March 2021, and the discounts on MTR City Saver and Monthly Pass Extras

will be effective till June 2021. Government agreed to bear half of the total actual revenue forgone arising from these measures during the period between July 2020 and March 2021.

SERVICE PERFORMANCE

Despite the difficult circumstances presented by the COVID-19 pandemic, train service delivery and passenger journeys on-time for our heavy rail network both remained at 99.9% in 2020, exceeding the targets set in our Operating Agreement and our own even more demanding Customer Service Pledges. Train service delivery is a measure of the actual train trips run against the train trips scheduled to be run by the Company. Passenger journeys on-time is a measure of all passenger journeys that are completed within five minutes of their scheduled journey times.

In 2020, more than 1.78 million train trips were made on our heavy rail network and more than 1 million trips were made on our light rail network. There were eight delays on the heavy rail network and no delays on the light rail network, respectively, defined as those lasting 31 minutes or more and attributable to factors within the Company's control. The light rail network continued its record dating back to 2019 of no delays lasting 31 minutes or more and attributable to factors within the Company's control.

On 11 September 2020, we announced a delay in the commencement of the new signalling system and gradual introduction of new trains on the East Rail Line in order to properly resolve the route recall situation, which has no impact on safety. An Investigation Panel was convened and an investigation report was submitted in January 2021. Safety has been reaffirmed by the technical investigation, which showed that the concerned issue was caused by a non-safety-critical software module being overloaded by a new software module specifically built for the Company to provide extra train monitoring information to the Operations Control Centre. The contractor resolved the issue by upgrading the software and stopping the new software module. Following satisfactory completion of all further testing and approvals from relevant Government departments on the safe and sound condition of the new signalling system and new trains, the new signalling system and trains were commissioned on 6 February 2021.

On 3 March 2020, MTR released to the public the investigation report detailing the train derailment that occurred in September 2019 when three cars of a Hung Hom-bound East Rail Line train shifted out of their positions on the track, causing the fourth and fifth cars to separate. Investigators concluded that the derailment was caused by dynamic track gauge widening at a turnout near Hung Hom station. Following the release of the report, the Company took immediate actions according to the recommendations of the panel to prevent similar incidents from occurring again in future.

To gauge customer satisfaction levels concerning our services and fares, we carry out regular surveys and research, the results of which are published in our Service Quality Index and Fare Index, respectively.

Service Quality Index	2020	2019
Domestic and Cross-boundary services	64 [^]	66
Airport Express	N/A [*]	79
Light Rail	62	58
Bus	75	68
HSR	N/A [*]	83

Fare Index	2020	2019
Domestic and Cross-boundary services	59 [^]	56
Airport Express	N/A [*]	70
Light Rail	61	58
Bus	74	66
HSR	N/A [*]	78

[^] This only measured Domestic Service as the Cross-boundary services of Lo Wu and Lok Ma Chau were closed from early February 2020.

^{*} The Voice of Customer surveys for Airport Express and HSR in 2020 were suspended due to the outbreak of the COVID-19 pandemic in 2020.

MTR is one of the participants in The Community of Metros ("CoMET"), which comprises 20 metro systems around the world to benchmark performance and improve practices across the industry. In 2019, our performance was greatly affected by the public order events and saw unfavourable change in some of the key performance indicators. The 2019 CoMET benchmarking results can be found in the "Performance Metrics" section of our sustainability website.

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Operations Performance in 2020

Service Performance Item	Performance Requirement	Customer Service Pledge Target	Actual Performance
Train service delivery			
– Kwun Tong Line, Tsuen Wan Line, Island Line, Tseung Kwan O Line, South Island Line, Tung Chung Line, Disneyland Resort Line and Airport Express	98.5%	99.5%	99.9%
– East Rail Line (including Tuen Ma Line Phase 1)	98.5%	99.5%	99.8%
– West Rail Line	98.5%	99.5%	99.9%
– Light Rail	98.5%	99.5%	99.9%
Passenger journeys on-time			
– Kwun Tong Line, Tsuen Wan Line, Island Line, Tseung Kwan O Line, South Island Line, Tung Chung Line and Disneyland Resort Line	98.5%	99.5%	99.9%
– Airport Express	98.5%	99.0%	99.9%
– East Rail Line (including Tuen Ma Line Phase 1)	98.5%	99.0%	99.9%
– West Rail Line	98.5%	99.0%	99.9%
Train punctuality			
– Kwun Tong Line, Tsuen Wan Line, Island Line, Tseung Kwan O Line, South Island Line, Tung Chung Line and Disneyland Resort Line	98.0%	99.0%	99.8%
– Airport Express	98.0%	99.0%	99.9%
– East Rail Line (including Tuen Ma Line Phase 1)	98.0%	99.0%	99.9%
– West Rail Line	98.0%	99.0%	99.9%
– Light Rail	98.0%	99.0%	99.9%
Train reliability: train car-km per train failure causing delays ≥5 minutes			
– Kwun Tong Line, Tsuen Wan Line, Island Line, Tseung Kwan O Line, South Island Line, Tung Chung Line, Disneyland Resort Line and Airport Express	N/A	700,000	5,267,876
– East Rail Line (including Tuen Ma Line Phase 1) and West Rail Line	N/A	700,000	8,877,544
Ticket reliability: smart ticket transactions per ticket failure			
– Kwun Tong Line, Tsuen Wan Line, Island Line, Tseung Kwan O Line, South Island Line, Tung Chung Line, Disneyland Resort Line, Airport Express, East Rail Line (including Tuen Ma Line Phase 1) and West Rail Line	N/A	10,500	34,919
Add value machine reliability			
– Kwun Tong Line, Tsuen Wan Line, Island Line, Tseung Kwan O Line, South Island Line, Tung Chung Line, Disneyland Resort Line and Airport Express	98.0%	99.0%	99.8%
– East Rail Line (including Tuen Ma Line Phase 1)	98.0%	99.0%	99.9%
– West Rail Line	98.0%	99.0%	99.9%
Ticket machine reliability			
– Kwun Tong Line, Tsuen Wan Line, Island Line, Tseung Kwan O Line, South Island Line, Tung Chung Line, Disneyland Resort Line and Airport Express	97.0%	99.0%	99.8%
– East Rail Line (including Tuen Ma Line Phase 1)	97.0%	99.0%	99.9%
– West Rail Line	97.0%	99.0%	99.9%
– Light Rail [^]	N/A	N/A	N/A
Ticket gate reliability			
– Kwun Tong Line, Tsuen Wan Line, Island Line, Tseung Kwan O Line, South Island Line, Tung Chung Line, Disneyland Resort Line and Airport Express	97.0%	99.0%	99.9%
– East Rail Line (including Tuen Ma Line Phase 1)	97.0%	99.0%	99.9%
– West Rail Line	97.0%	99.0%	99.9%
Light Rail platform Octopus processor reliability[*]	N/A	N/A	N/A
Escalator reliability			
– Kwun Tong Line, Tsuen Wan Line, Island Line, Tseung Kwan O Line, South Island Line, Tung Chung Line, Disneyland Resort Line and Airport Express	98.0%	99.0%	99.9%
– East Rail Line (including Tuen Ma Line Phase 1)	98.0%	99.0%	99.8%
– West Rail Line	98.0%	99.0%	99.9%
Passenger lift reliability			
– Kwun Tong Line, Tsuen Wan Line, Island Line, Tseung Kwan O Line, South Island Line, Tung Chung Line, Disneyland Resort Line and Airport Express	98.5%	99.5%	99.8%
– East Rail Line (including Tuen Ma Line Phase 1)	98.5%	99.5%	99.9%
– West Rail Line	98.5%	99.5%	99.9%
Temperature and ventilation			
– Trains, except Light Rail: to maintain a cool, pleasant and comfortable train environment generally at or below 26°C	N/A	97.5%	99.9%
– Light Rail: on-train air-conditioning failures per month	N/A	<3	0
– Stations: to maintain a cool, pleasant and comfortable environment generally at or below 27°C for platforms and 29°C for station concourses, except on very hot days	N/A	93.0%	99.9%
Cleanliness			
– Train compartment: cleaned daily	N/A	99.0%	99.9%
– Train exterior: washed every two days (on average)	N/A	99.0%	100.0%
Northwest transit service area bus service			
– Service Delivery	N/A	99.0%	99.7%
– Cleanliness: washed daily	N/A	99.0%	100.0%
Passenger enquiry response time within six working days	N/A	99.0%	100.0%

[^] Repair works on damaged Light Rail Ticket Machines are underway. Performance data will be available after completion of repair and testing works.

^{*} Light Rail Platform Octopus Processor replacement works and testing are underway. Performance data will be available after completion of installation, testing and trial operations of the new processors.



ENHANCING THE CUSTOMER EXPERIENCE

Delivering a world-class customer experience is one of the hallmarks of MTR and a major focal point of our Corporate Strategy as we seek to constantly improve the comfort and utility of our services for passengers from all walks of life. During the year under review, we invested more than HK\$10.9 billion to maintain, upgrade or replace our Hong Kong railway assets.

Boosting Passenger Convenience

New Line Openings

On 14 February 2020, MTR opened Phase 1 of the Tuen Ma Line, commencing services at the new stations of Hin Keng Station and Kai Tak Station, as well as the expanded section of Diamond Hill Station. Passengers travelling on the former Ma On Shan Line can now travel to Kai Tak Station in East Kowloon via Hin Keng and Diamond Hill stations without needing to interchange. To celebrate the launch, we offered a special fare promotion for passengers. The average daily usage of these three stations from opening to the end of 2020 was 125,000 passengers.

During the year, the frequency of our train services was affected by COVID-19 and the implementation of work-from-home arrangements, social distancing measures and travel restrictions. In response, we adjusted

our scheduling in a timely manner according to the latest situation to meet fluctuating passenger demand and deliver the highest level of service convenience.

Greater Comfort for Passengers

New Trains

MTR ordered 93 new heavy rail eight-car trains earlier, nine of which had been delivered as at the time of writing. Two more are scheduled to be delivered by early 2021. Testing and commissioning continue with the aim of retiring older trains before their life expiry.

New Light Rail Vehicles

We ordered 40 new light rail vehicles to retire older vehicles and meet increasing demand for light rail services. Two of these light rail vehicles were put into service in November 2020. As at the end of 2020, eight more had been delivered and were undergoing testing and commissioning. By 2023, we expect the size of our light rail fleet to be expanded to 150.

Replacement of Air Conditioning Systems

Work to replace approximately half our chillers with newer, more energy-efficient models continued throughout our stations and depots this year. We

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completed Phase 3 in November 2020; a total of 92 chillers in 18 stations and four depots have now been replaced. Phase 4 began in fourth quarter 2020, which involved the replacement of another 32 chillers in eight stations and one depot and is expected to be completed in April 2021. The completion of all phases of work is expected in 2023, at which time passengers will be able to enjoy even more comfortable train and station environments.

Upgrading of Signalling System

In order to increase the overall capacity of our services, we are in the process of upgrading our signalling system. Software revamping and assurance work on the Tsuen Wan Line signalling system is progressing slowly, further compounded by COVID-19 lockdown measures imposed at the contractor's office in Canada. We are also replacing the signalling systems for the Island, Kwun Tong and Tseung Kwan O lines. Work on the signalling of the Tung Chung and Disneyland Resort lines as well as Airport Express will be planned together with the Tung Chung Line Extension under Railway Development Strategy 2014.

Enhancing Station Facilities

During the year, we continued our efforts to make the passenger experience as comfortable and convenient as possible. In February 2020, new public toilets and baby care rooms were opened at the stations along the newly opened Tuen Ma Line Phase 1, followed by openings at Yau Ma Tei Station in June 2020 and North Point Station in September 2020. New toilet and baby care rooms are scheduled to be opened at Tsim Sha Tsui Station by 2022. New external lifts and escalators were provided to further improve barrier-free access at stations. Over 100 passenger lifts across the network have now been equipped with "contactless" lift button sensors to protect our customers during the pandemic.

To cater for growing passenger demand for public drinking water facilities, support environmental protection and support Government in its pursuit of related policies, we continued to install drinking water dispensers at selected stations throughout the year. Seven newly installed dispensers were put in service in 2020. We plan to have water dispensers installed at 18 stations by 2022.

To meet the needs of Hong Kong's growing aged population, we installed a number of extra seats in

concourses and on platforms to provide more places to rest. We also completed the repainting of platforms and replacement of platform seats at 17 light rail stops during the year for improved station environment and comfort. Works for remaining light rail stops are scheduled to be completed by 2025.

To help passengers stay connected while on the go, our free Wi-Fi coverage was expanded during the year from station hotspots to all of the station concourse and platform areas. In addition, mobile charging stations, including USB charging sockets and wireless charging pads, are now available in 29 stations.

Enhancing Customer Journeys Through Technology

Smart Mobility

New innovations and technologies are cornerstones of our future growth as we fully implement our Corporate Strategy. In May 2020, we launched a new version of MTR Mobile to provide customers with railway and other transport information and functions, as well as news and offers from MTR Malls and MTR Shops plus a variety of lifestyle content. The app also features the MTR Points loyalty scheme whereby customers can earn and redeem MTR Points.

In August 2020, MTR Mobile's "Next Train" function was extended to the light rail network. Passengers may now check the estimated arrival times for up to five routes at each platform of any light rail stop, in real time.

In October 2020, the app's "Trip Planner" was improved to recommend up to three journey options, each supplemented with estimated travel times, interchange walking times and numbers of interchanges. "Traffic News" was also enhanced to inform passengers of any service disruptions based on their pre-set route via push notifications.

MTR is also committed to offering the latest in smart mobility. A number of initiatives were introduced in 2020 to digitalise and automate customer touchpoints and deliver a smarter, more seamless travel experience. For example, passengers can purchase monthly passes in advance via MTR Mobile and avoid queuing in stations. Students may now use the app to renew their "Student Status" on their Octopus cards and continue enjoying concessionary fares. Starting from 23 January 2021, a brand-new QR code payment service for the heavy rail

network was launched, which enables passengers to tap entry and exit gates using a QR Code Ticket on MTR Mobile or EasyGo on AlipayHK.

Smart Operations and Maintenance

MTR continued to explore robotics and automation to improve the effectiveness and efficiency of a variety of maintenance and back-of-house processes. In the third quarter of 2020, we introduced five AI-powered “smart trainee” robots at Kai Tak Station to perform cleaning, inspection and customer relations tasks. In May, we launched the InnoEtronic invention zone and robotics co-working space at Kowloon Bay Depot, a strategic partnership with 13 local start-ups and industry solution experts. The project aims to support the development and application of innovative technologies for smart maintenance, inspire future innovators and provide a working space for them to develop proof-of-concept projects and trials.

Following its successful introduction at Pat Heung Depot, we expanded the use of the Automatic Air-conditioning Filter Cleaning Machine (“ACM”) to Chai Wan depot. ACMs replace tedious manual cleaning and help standardise filter cleaning quality and efficiency. We also began trialling the Underframe Inspection Robot (“UIR”) at Pat Heung Depot. The UIR adopts cutting-edge technologies, including image recognition, AI and precise

motion control, to identify and report anomalies in the underframes of rolling stock. We also started trialling a Smart Train Roof and Pantograph Monitoring System at the Tuen Ma Line Phase 1, which automatically captures a complete image of the train pantograph and train roof and uses image recognition technology to identify potential anomalies and alert users to prevent further escalation of failure.

During the year, MTR introduced leading-edge smart asset management technologies such as blockchain, cloud computing and AI to streamline its supply chain, improve workflow and collaboration, and optimise train deployment and maintenance. We also continued to apply digital technology to improve our maintenance records and processes. MTR has also introduced a smart Track Dynamic Performance System on East Rail Line trains to monitor in real time the critical track geometry parameters and vibration measurements along the line, thereby facilitating predictive and prescriptive maintenance. In April 2020, we began using the Smart Forms mobile app to digitise maintenance information and records, resulting in faster and higher-quality maintenance works.

On the Light Rail, our innovative Integrated Speed and Position Supervision System was enhanced so that the speed of light rail vehicles can be monitored in real time, further improving operational safety and efficiency.

