



Safety-First Culture

Bringing MTR to Continuous & Global Excellence

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Managing Director – Operations & Mainland Business
23 October 2017

Agenda

- **Introducing MTR**
- **Safety First Culture**
- **Global Operational Safety**
- **Future Challenges**

MTR Operations in Hong Kong



Heavy Rail



Airport Express



Light Rail



Intercity



Bus



**Guangzhou-Shenzhen-Hong Kong Express Rail Link
To be opened in Q3 2018**

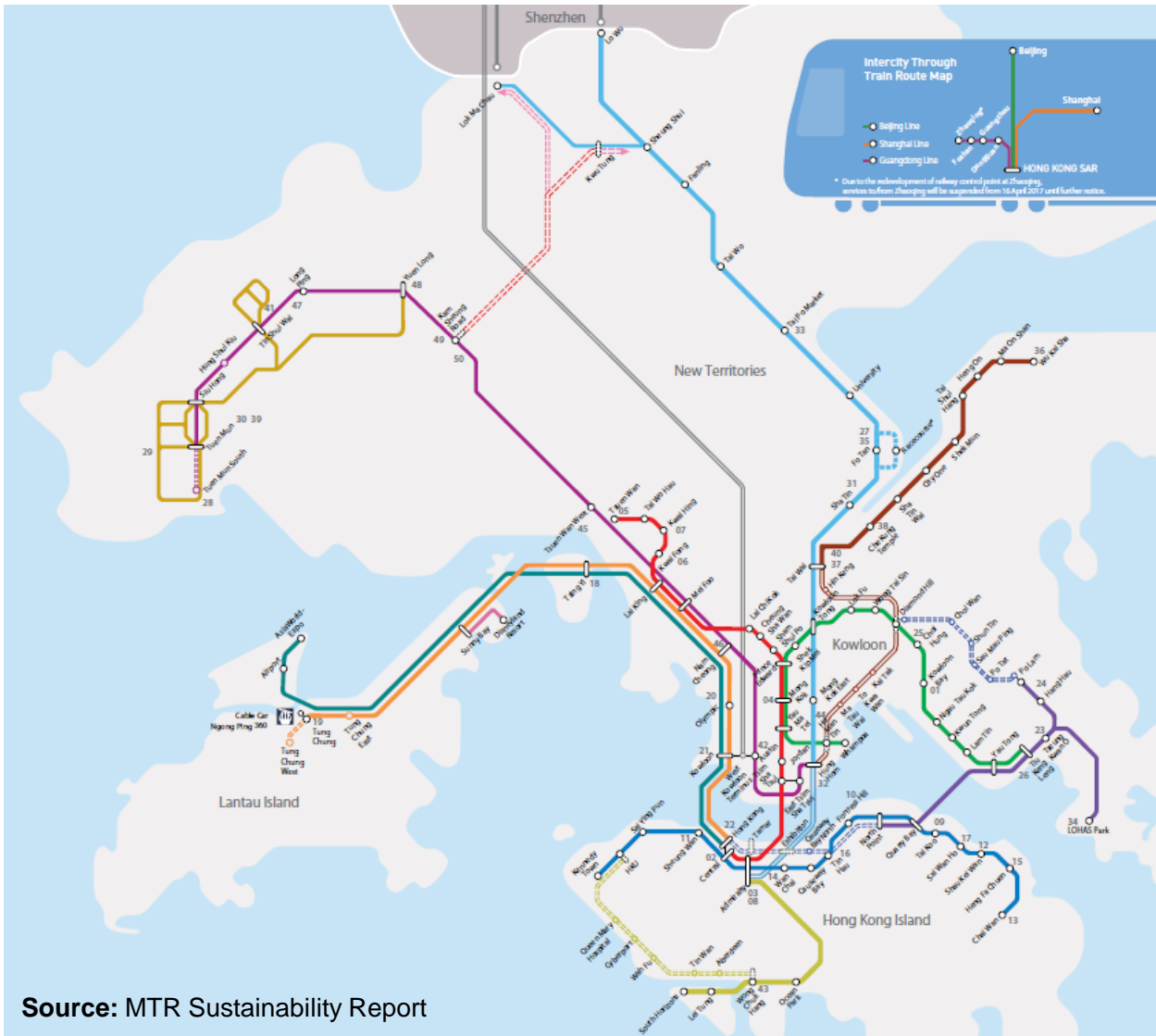
MTR Network in HK is Expanding

Total Route Length in HK

1980 *
15.6 km

2016
230.9 km

14.8x



Source: MTR Sustainability Report



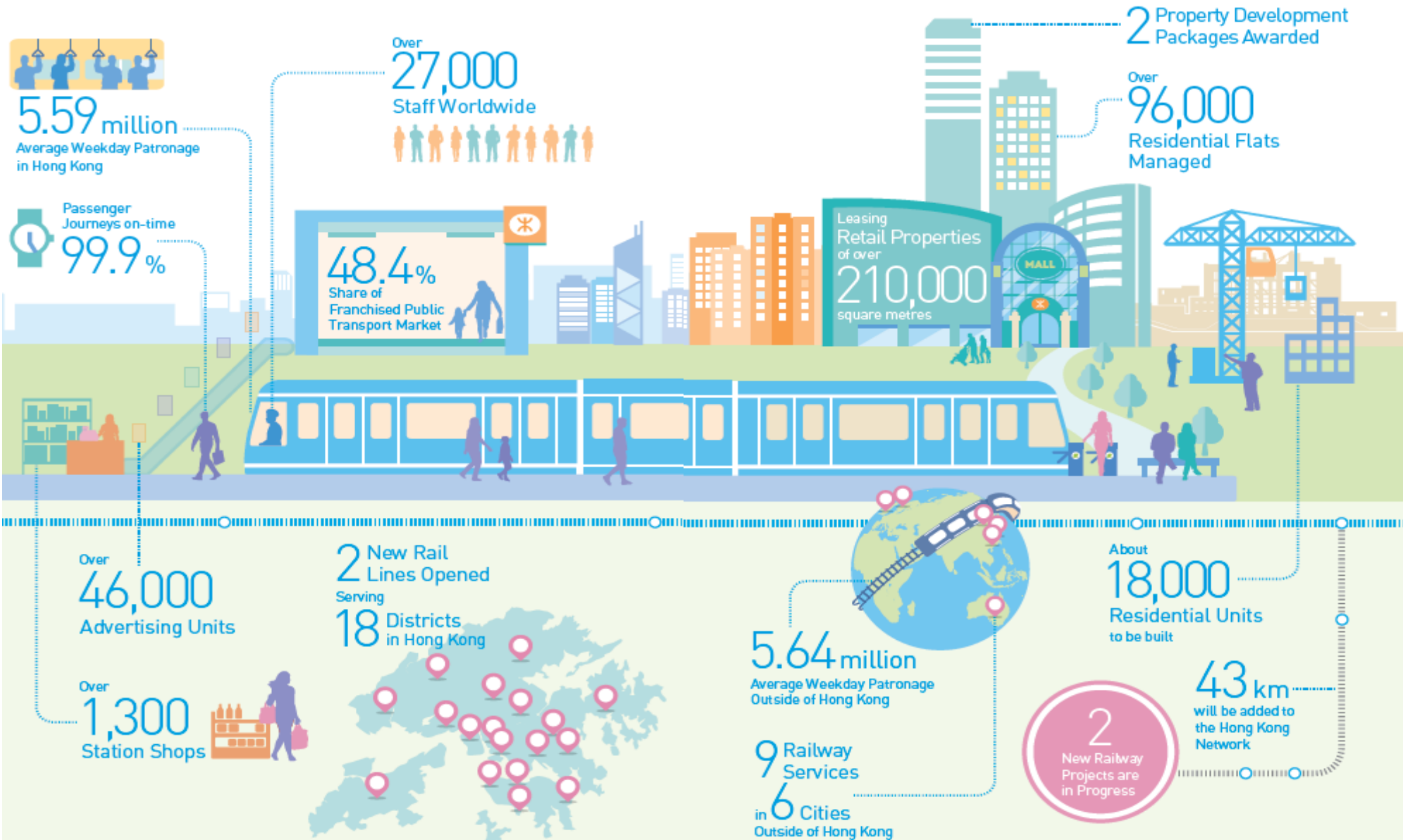
MTR established in 1975

2 rail projects completed in 2016; MTR is present in all 18 districts in Hong Kong

2 rail projects totally **43km** under construction

* First network (Modified Initial System) commenced in 1979 with its full line opening in 1980.

MTR Network in HK is Expanding



Source: MTR Annual Report 2016

MTR Network outside HK is also Expanding

Global Network

2004 88 km → 2016 1,192 km ↑ 13.5x



Stockholm Metro (MTR Tunnelbanen)
 MTR Tech (renamed from TBT)
 Stockholm Commuter Rail (MTR Pendeltågen)
 EM Tech AB
mtr express | MTR Express

mtrcrossrail | London Crossrail
 South Western Railway
 South Western Railway



Beijing Line 4
 Beijing Daxing Line
 Beijing Line 14
 Beijing Line 16 (Phase 2 under construction)



Hangzhou Line 1 + Extension
 Hangzhou Line 5 (being constructed)



Shenzhen Line 4



Sydney Metro Northwest



Metro Trains Melbourne



As of 30 Jun 2017	Average Weekday Patronage	Route Length (in operation)
Mainland of China & International	5.79 M	>2,000 km*



An aerial photograph of a complex, multi-level rail system. Several trains are visible on different tracks. In the foreground, a white and blue train is moving towards the viewer. To its left, a blue train is moving away. In the background, a long, white train is curving along a track. The tracks are supported by concrete pillars and are surrounded by urban infrastructure, including buildings and roads.

Safety Performance

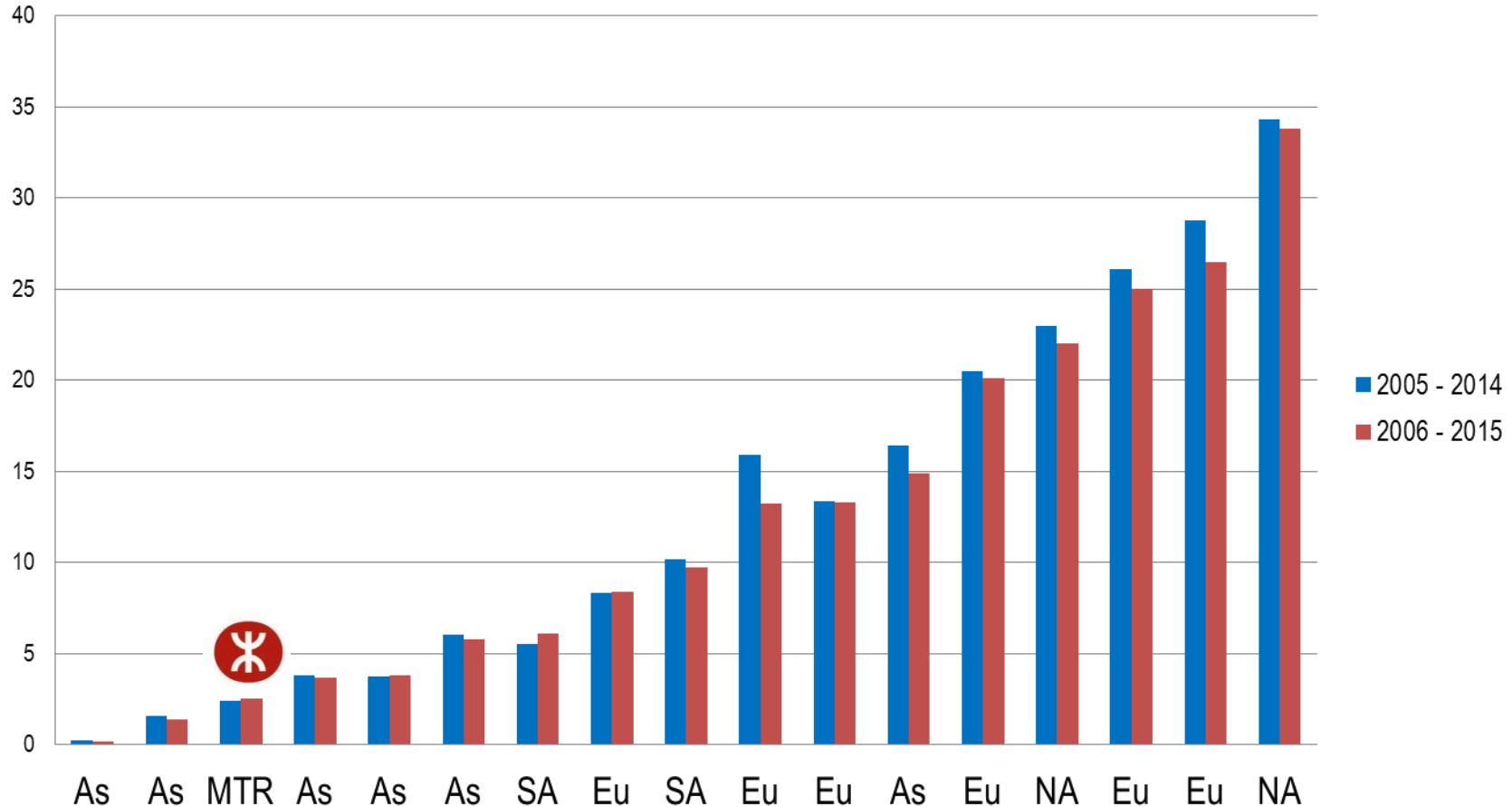
MTR Runs Very Well in HK – Safety Performance

achieved a high level and continuous improvement in Operational Safety

Fatalities per Billion Passenger Journeys

include suicide, accidents & illegal activities, 10-year average

↑ worse
↓ better



Source : CoMET 2016 Interim KPI Database (2015 data). Only metros with data are listed

AS – Asian Metros

EU – European Metros

NA – North American Metros

SA – South American Metros

MTR Runs Very Well in HK – Operations Performance

“The MTR is probably the best-run subway system in the world.....”



Source: CATO Institute, USA, 18 January 2017
(<https://www.cato.org/blog/privatize-washingtons-metro-system>)



10 metro lines
1 Airport Express
1 Light Rail System
Total network length: 231km



Annual patronage: 1.9Bn
Average weekday patronage: 5.6M
On-time performance \geq 99.9%
EBITDA (2016): HK\$7.6Bn



In quote from **CHINADAILY ASIA**

Though the total length of MTR lines is dwarfed by those of metro systems in other Asian metropolises such as Tokyo, Beijing and Shanghai, the MTR still stands out in terms of its capacity, convenience, punctuality and passenger-friendliness. **The MTR, the jewel in the crown of Hong Kong's public transport system, is now a pride of the city.**

Source: China Daily Asia, 17 Jan 2017
http://www.chinadailyasia.com/opinion/2017-01/16/content_15557097.html

“Experts tell me that the Hong Kong Mass Transit Railway (MTR) is amongst the best in class on rail reliability.”

Source: blog of Singapore's Transport Minister Khaw Boon Wan
9 Oct 2015
(<https://motsingapore.wordpress.com/2015/10/09/catching-up-with-hk/>)



“Gold Award – Service Appreciation Award 2017”
selected by the Hong Kong Association for Customer Service Excellence

Good Safety Performance and Management in HK

Evidenced by “ROSE” Response for the Arson Incident



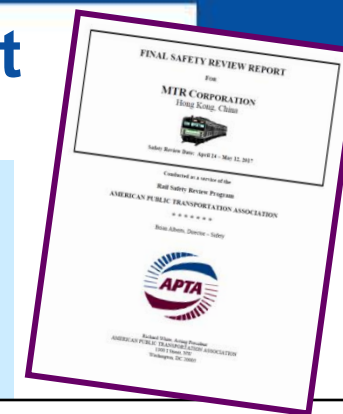
Robust			Orderly
<ul style="list-style-type: none"> ✓ Train, station and system design ✓ Equipment maintenance ✓ Emergency procedures ✓ Crisis Management Organization ✓ Staff competence 	R	O	<ul style="list-style-type: none"> ✓ Detrainment ✓ Platform to concourse evacuation
Speedy	S	E	Effective
<ul style="list-style-type: none"> ✓ Detrainment < 1 min ✓ Evacuation to concourse within 2.5 mins after evacuation PA ✓ Police and FSD arrived 2 and 4 minutes respectively after train arrived platform ✓ Fire distinguished in 2 mins 			<ul style="list-style-type: none"> ✓ Working of Train, station and system ✓ Emergency procedures execution ✓ Overseen by Crisis Management Team (CMT)



Good Safety Performance and Management proved by independent reviewer

*“The effort of MTR Corporation to achieve a strong degree of program implementation in all areas of system operation is due to **the effectiveness of its management, and a strong commitment to voluntarily comply with all safety recommendations....** Throughout the review the audit team identified **240 Effective Practices and 29 Industry Leading Effective Practices.**”*

(MTR 9th External SMS Review May 2017)




No.	Category	Practice
1	Infrastructure	Rail failures into its simulator scenarios taught to Train Captains
2	Maintenance &	Integrated parts re-ordering algorithm in Rail Assure
3	Inspection	Adopting ISO 55001
4	Vehicle Maintenance	High priority on Asset Management within the Rolling Stock
5	Training &	Assist new staff with prefix in radio communications
6	Certification	Train Captains Caring Program
7		Candidates for the Controller required for scenario-based aptitude test
8	Emergency Response	AEDs in all stations saving lives
9	Planning	Emergency protocol that include training all the shop owners and their staff
10	Workplace Safety	Star Quality Index (SQI)
11	Programs	Procedure to prevent staff or contractors going onto the track before current is switched off by requiring a code to open a local key box
12		Efficient and safe installation and testing of a new signal system within narrow NTH, while maintaining existing levels of reliable service
13	Passenger & Public	Safety promotions with primary focus on escalator safety
14	Safety Programs	Escalator safety has significantly improved due to creative safety awareness initiatives and promotions
15		introduction of “silver bullet” trains, Inflow Control Action (ICA) and Super Inflow Control Action (SICA)
16		Annual inspection by the Station Manager of all the shops in addition to periodic inspections by Marketing staff
17		Station Crowd Control Plan well documented and drills conducted on a scheduled basis
18		Measures implemented to control the capacity constraints, particularly at critical NCO stations
19		Establishment of a NCO Steering Committee
20		OCC with dedicated teams to control train, communications & traction if effective over critical tasks, allowing TC to focus on NCO stations
21	Operational Safety	Addressing challenge of suicide on the East Line which does not have the benefit of platform screen doors
22	Hazard Management	All maintenance employees are encouraged to ride the system
23	Process	Value Assessment process
24		Integrated planning approach for clear service requirements documentation, in coordination with HK govt and community stakeholders
25		iSPOTit APP - a streamlined technology based reporting system utilizing a cellular phone Application
26	Acc/Incident Report	Displaying the time elapsed on the large clock in OCC from the start of an incident along with the actions that need to be taken
27	Loss Prevention&Ctrl	(WMO) to ensure minimal conflicts between implementation of concurrent mega projects into existing operations
28	Internal Safety	An aggressive and efficient succession planning process such as Talent Farming
29	Mgmt Assessment	progressive human resource management schemes

Good Safety Performance and Management proved by independent reviewer

Examples of Industry Leading Effective Practices:

- Escalator safety has significantly improved for the period of 2012 to 2016 with escalator accidents / incidents reduced by 37%, as a result of creative safety awareness initiatives and promotions, such as handrail visibility and escalator stair footprint markings.
- While MTR continues to encourage staff members to report unsafe conditions through conventional means, a streamlined technology based reporting system utilizing a cellular phone application - iSPOTit APP, was introduced.
- Operational strategies, such as the introduction of “silver bullet” trains (empty trains operating from the depots directly to the busiest stations without stopping at the intermediate stations) has helped significantly control the crowding conditions at the affected stations.



An aerial photograph of a complex railway system with multiple tracks and several high-speed trains in motion. The trains are white with blue and red accents. The tracks are elevated and run parallel to each other. The background shows some greenery and infrastructure.

Safety First Culture

- **Commitment and Processes**
- **Mindset**
- **Competence**
- **Continuous Promotion**

MTR Good Safety Performance in HK

driven by MTR Corporation Safety First Culture



Oversight of Implementation

公司安全政策	Corporate Safety Policy
<p>確保顧客、公眾人士、承辦商和員工的安全是公司的先決條件。為此，港鐵公司承諾持續符合所有法定要求，並致力維持一個安全至上的文化，以及採用有效的管理機制，不斷提升各業務範疇的安全表現，務求達到港鐵公司的安全目標。</p> <p>確保安全是每個人應時刻履行的責任和義務，需要公司全體人員共同積極實踐。我們無論做任何事情，在任何時候，均須謹記安全至上。每位總監、經理和督導均有責任推行安全管理，而每位員工均有責任保障顧客、公眾人士、承辦商、同事和本身的安全。</p>	<p>Safety of our customers, the public, contractors and employees is an absolute pre-requisite. MTR Corporation is committed to consistently meeting statutory requirements, maintaining a safety-first culture, employing management systems to achieve MTR Corporation's safety goals for continuous improvement in safety performance in all aspects of the business.</p> <p>Safety demands active involvement by all. It is the responsibility and duty of everyone and should be foremost at all times in everything we do. Safety management is the responsibility of each director, manager and supervisor. All employees have a duty to protect our customers, the public, contractors, colleagues and themselves.</p>
2007年12月2日	2 December 2007



MTR Corporation's Safety First Culture

with key principles implemented in Operations

安全第1
質量至上

Safety
First
Quality
Always



勿走捷徑

時刻遵循鐵路安全規則、程序及工作指引。

對隱患提高警覺

必須時刻留意身邊隱患，採取保護措施加以控制。



勇於發言遇事必報

當發現任何不符合標準、常規或預期的情況，應勇於作出匯報。

阻止不安全行為

當觀察到不安全行為，應立即糾正；如有即時風險，應立即停止工作並作出上報。



Do Not Cut Corners

Comply with railway safety rules, procedures and work instructions all the time

Beware of Hazards

Know the hazards and apply necessary protective measures

Speak Up

Report anything that deviates from standards, normal conditions and expected conditions

Stop Unsafe Act

Stop and correct any unsafe act and immediately report any imminent danger

Safety First Quality Always Culture embedded in staff mindset



Timely Reminder and Regular Reinforcement



Continuous Learning and Sharing



Ingrain Mindset



Safety First Workshop for New Joiners



Promotional materials/activities and programme

Resources available in intranet

Safety First Quality Always Culture

embedded in staff competency

- Safety Management Training in addition to job knowledge training

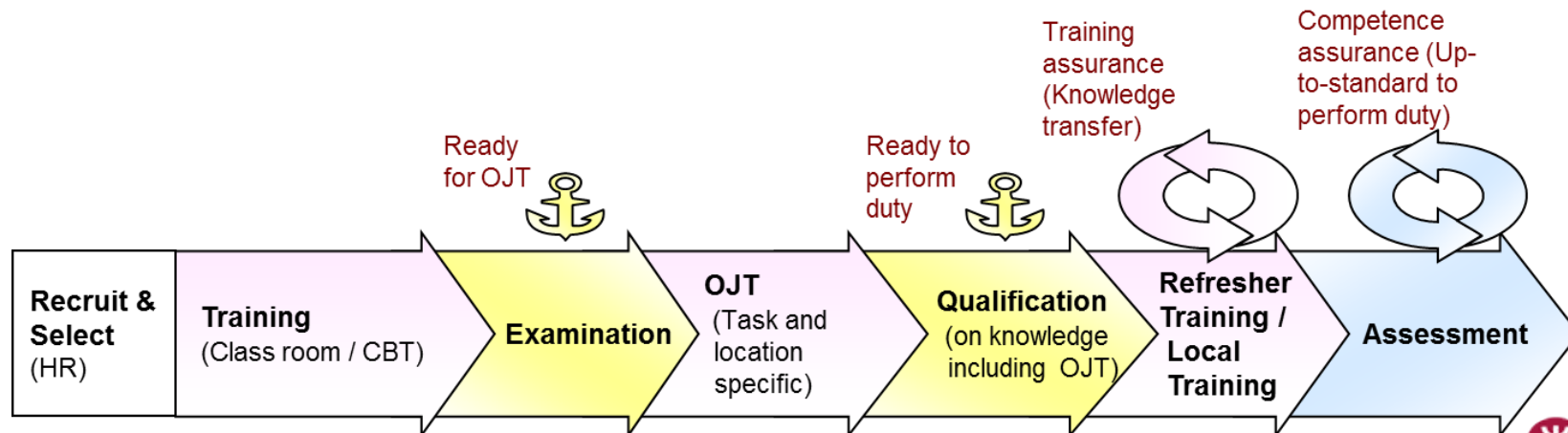


Corporate Safety Management Training



Fundamentals of Supervising for Safety Training

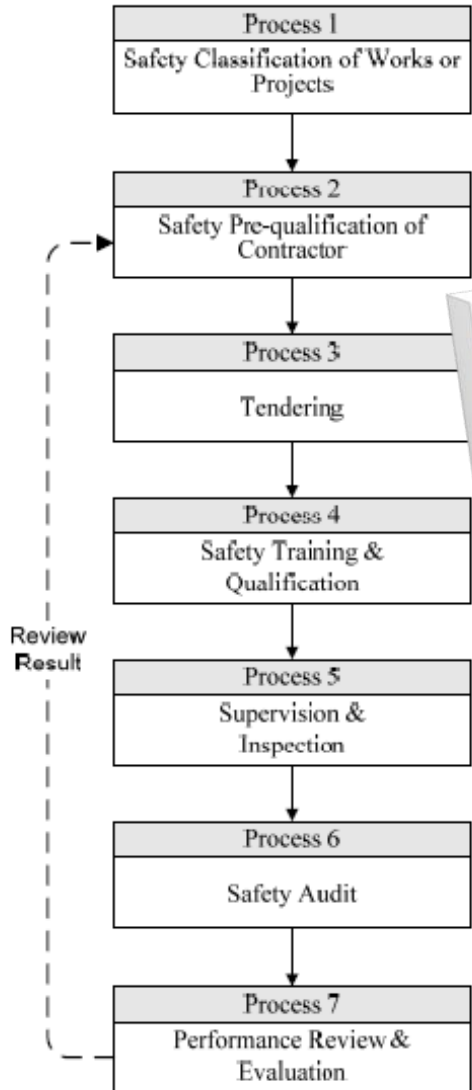
- Competence management for whole lifecycle



Safety First Quality Always Culture

also promoted to Contractors

Embedded in Contractor Safety Management System



Safety Promotional Materials / Activities

新華白 7月號

承辦商員工使用打草機清除雜草 不慎擊傷同事

事故

今年5月17日，兩名承辦商員工於某商場地址2號水塘使用打草機清除雜草時，由於員工轉身時不慎把打草機的機頭部份撞向同事的手柄突然轉動，使手柄於該轉動中的回轉時打在前排員工雙腳的大腿上。

提醒

打草時員工之間必須保持一定的安全距離

- 兩名員工工作的地方相距太近。
- 承辦商應重新設計有關的工作位置。
- 指定打草時員工之間的最小安全距離為3米。
- 進行打草工作時應穿安全鞋。
- 承辦商應對打草工作進行安全檢查。
- 指定打草工作應在安全區域內進行。
- 打草工人應注意其安全。



2015/16 承辦商安全表現獎 Contractor Safety Performance Award

Contractor Reportable Accident (RA) Frequency Rate of Operations Division in years 2012 - 2015

年份	承辦商
2015	新華白 (New Hua White)
2014	新華白 (New Hua White)
2013	新華白 (New Hua White)
2012	新華白 (New Hua White)

獲獎承辦商 Winning Contractors

年份	承辦商
2016	新華白 (New Hua White)
2015	新華白 (New Hua White)
2014	新華白 (New Hua White)
2013	新華白 (New Hua White)
2012	新華白 (New Hua White)

Safety First Quality Always Culture

also promoted to Customers

Public Education via media and social media

港鐵緊急事故應變教學 助乘客遇險求生

02月16日(四) 08:30

推介 958



Safety promotion using various means



Safety Activities, e.g. emergency drills with customer participation, school talk, elderly centre visit

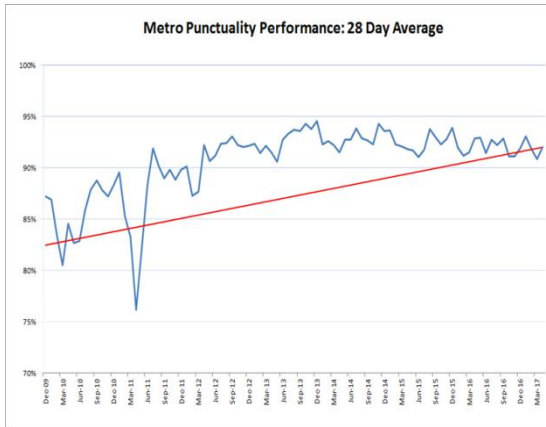


An aerial photograph of a complex, multi-level high-speed rail system. Several trains are visible on different tracks, including a white and red train, a blue train, and a white train with a red stripe. The tracks are elevated and supported by concrete pillars. The background shows some greenery and buildings.

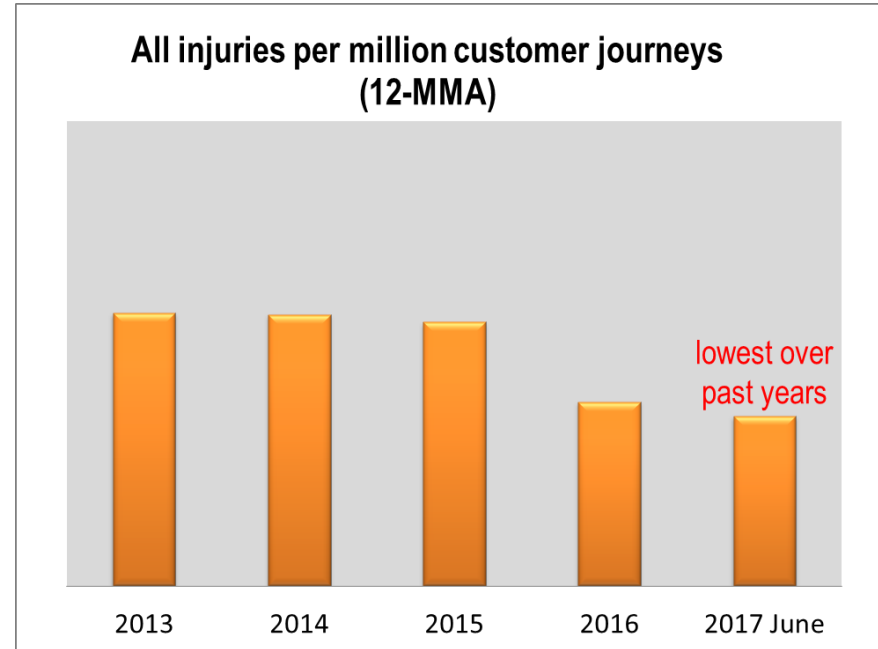
Global Operational Safety

MTR Runs Very Well outside HK

both Operations and Safety Performance



Continued to improve



Mainland China & International Business Rail operations safety performance is on a favourable trend



MTR EXPRESS NAMED THE BEST TRAIN COMPANY BY SKI

We can proud to announce that, for the second year in a row, we at MTR Express were named the best train company in Sweden. We are grateful to have the most satisfied Swedish train travellers on our seats.

2017年1月-3月 港铁深圳4号线列车服务表现
为您更美好, 2017年第一季度服务数据达标

- 列车准点率: 99.98%
- 列车服务满意度: 99.98%
- 列车服务投诉率: 99.94%
- 列车服务安全: 4,017,501 人次/列车
- 列车服务安全: 100%

心生活每一程 MTR 港铁

Good Performance outside HK

with management support to transplant the same **Safety First Culture** to every business unit



Good Performance outside HK

supported by safety programme in every business unit



UK – Program to raise staff awareness on security and safety on rail network



Sweden – Customer safety campaign



Beijing – Customer Safety awareness education for primary school students



Hangzhou – Joint emergency drill with Police and Institute of Technology



福龙伴出行
就爱文明
人物篇



Shenzhen – Comics for safety promotion



Australia – Multiple award-winning customer safety campaigns

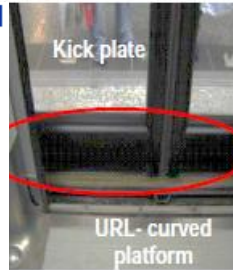


Good Performance outside HK supported by Sharing via Lessons Learnt, Intranet and Benchmarking

Identifying Good Practices and Establishing Corporate Safety Standards

Summary of PSD Trapping Risk Control Measures

Control Measures	MTR-HK	BULADKL	BUL14	SZL4 P1	SZL4 P2	HZL1
Mechanical Protection	Door bottom tapered panel or tapered plate	Panel (with ETP)	Plate	Plate	NI	Plate
Door edge blocking plate	Not needed	✓	✓	NI	Not needed	✓
Laser GND	NI	NI	(1)	✓	✓	NI
Platform end LED light plate	NI	✓	✓	✓	NI	NI
Door bottom kick plate and pressure strip	NI	NI	NI	NI	NI	NI
Platform gap floor CCTV	✓	✓	✓	✓	✓	✓
Others						
FAD	✓ (2)	✓ (4)	✓ (5)	✓ (2)	✓ (2)	✓ (4)
ESP	✓	✓	✓	✓	✓	✓



Sharing among business units around the world via intranet

Home Feedback Share

MTR Hong Kong Shenzhen Beijing Hangzhou Sweden Australia United Kingdom China Property NP360

Top Stories
Chairman Professor Fred Ma visits MTR's businesses in ...

Photo Gallery

FUN POLL
How can we be a greener company?
 Encourage recycling
 Use low-energy lights
 Turn down air-con
 Saving water

Sharing of Lessons Learnt from Worldwide accidents

MTRconnects 12 January 2015
Washington Metropolitan Area Transit Authority System Arcing
 Source of information: <http://www.wmata.com/>
<http://www.nhwashington.com/>
<http://www.rta.gov/fleetinvestigation/>
<http://www.mta.com/local/>
<http://www.flightops.com/>
 Causal factors
 • NTSB, without offering details, said

The incident
 • On Monday January 12, 2015, about 3:15 p.m., WMATA Yellow-line train 302 stopped after encountering an accumulation of heavy smoke traveling southbound in a tunnel between the L'Enfant Plaza Station and the Potomac River Bridge. After stopping, the rear car of the train was about 386 feet from the south end of the L'Enfant Plaza Station platform.
 • A following train, stopped about 100 feet short of south end at the L'Enfant Plaza Station platform about 3:25 p.m., and was also affected by the smoke. Passengers of both trains, as well as passengers on the station platforms, were exposed to the heavy smoke.
 • Both trains involved in this incident consisted of 6 cars and were about 450 feet in length. No derailment or fire were found at the scene.
Consequence
 • As a result of the dense smoke, about 200 passengers were detained with 86 of them were transported to local medical facilities for treatment. There was one passenger fatality.
Control & Protection Measures in MTR
 • Control of inflammable sources in tunnel
 ◦ Fire retardant / Low Smoke Zero Halogen cable insulation
 ◦ Electrical protection system on cable fault
 ◦ Track clear procedure after hot-work
 ◦ Regular tunnel cleaning to remove debris
 ◦ Routine inspection by patrolman
 • Evacuation and tunnel smoke extraction system
 ◦ Emergency Procedure and Regular Exercises
 ◦ Regular drills and exercises on fire scenarios to evacuate passengers from a tunnel including operation of the Tunnel Emergency Ventilation System
 • Actions in progress
 ◦ A benchmarking exercise on train fire and evacuation in tunnel among MTR (HK) and C&I business units is underway. Results will be presented to C&I Safety Management Comm and then Corporate Safety Management Committee.

Stringent control of fire risks and maintenance regime, emergency response and preparedness including drill consequence.

German Trains Head-on Crash near Bavarian town of Bad Aibling
 Source of information: www.bbc.co.uk/news/world-europe-30530530
www.aljazeera.com/...deaths-trains-crash
www.gulfnews.com/news/...germany-probes
www.flightops.com/
 Causal factors
 • The federal transportation minister said at the news conference that the crash happened on a curve which meant that the drivers had probably not seen each other. He said that the trains could have collided at very high speed because speed of up to 100 km/h was permitted at that section.
 • The accident took place near Bad Aibling, about 35 miles southeast of Munich.
 • Newspaper group PHD, citing sources close to the investigation, said a signaling station worker had manually deactivated the automatic signaling system to let the first train which was running late, go past. The 2nd train then forged ahead on the same track in the opposite direction, before the first was able to split off where the line divides into two.
 • The Bild newspaper said manually deactivating the signaling would have deactivated the automatic braking systems.
 • Two of the train's black boxes have been recovered, while investigators are still looking for the third one.
Consequence
 • It seems likely that one of the trains ran a red light, but it's hard to know why. It could be human error, technical problems or a combination of the two.
 • The line is fitted with a modern safety system that slows the train down if it is going too fast and then stops it automatically if it passes a red signal.
 • Drivers get warnings in the cab if there is a problem. The speed of each train suggests neither had any warning.

Analysis by Richard Westcott,
 Transport correspondent
 • 10 people were killed including the drivers and conductors of both trains.
 • About 50 severe injuries and 100 light injuries.

Key Safety Message
 Safety First! Over-emphasis on on-time performance may cause an even bigger problem.
 Version: 2016-2-12



An aerial photograph of a complex multi-level high-speed rail system. Several trains are visible on different tracks, including a white and red train at the top, a blue and white train at the bottom, and a long white train in the middle. The tracks are supported by concrete pillars and are surrounded by urban infrastructure.

Looking Ahead at Future Challenges

Sustainable Good Performance by Looking Ahead

Rail Industry Challenges

Aging Population



Near Capacity Operations



Asset Aging

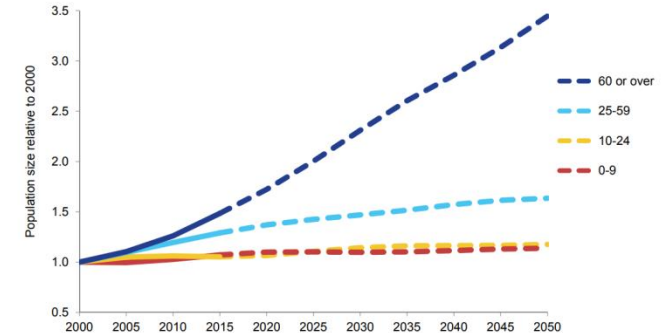


Rail Industry Challenges and MTR's Experiences

Aging population

Most rapid growth of aging population in the coming 30 years all over the world - About 1/8 MTR customers aged over 65 in 2020 which will bring about challenges in relation to safety, accessibility and operations.

Increase in world population relative to 2000, by broad age group, 2000-2050



Source: United Nations (2015). World Population Prospects: The 2015 Revision

Provision of Age-friendly facilities

Elderly Safety Education and Promotion



Priority Seat



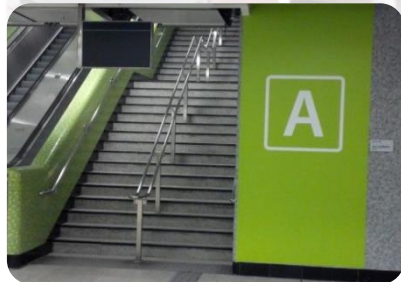
More Lifts



More Seats



Giant Signage



Provision of Magnifier at Customer Service Centre



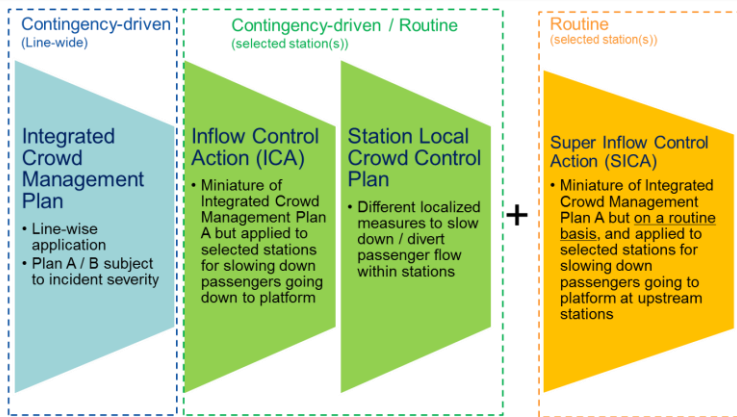
Rail Industry Challenges and MTR's Experiences

Near Capacity Operations

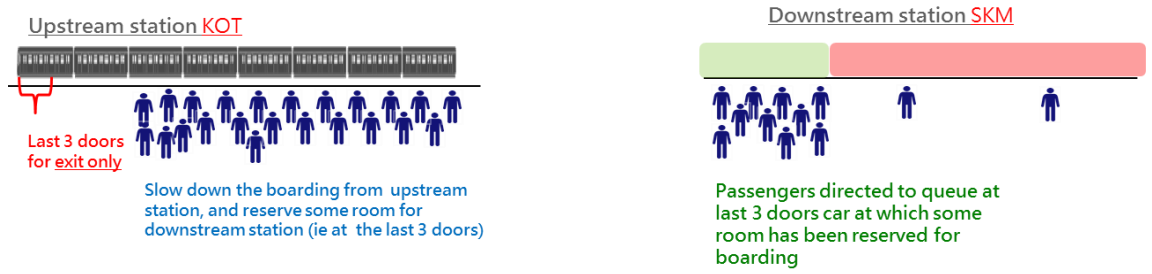
Railway systems grow toward design capacity as time goes by – MTR commenced railway services in 1979. With more lines in service and network effect, MTR runs near capacity in many lines.



More Systematic Station Crowd Management



Regulated Car Boarding Arrangement



Enhanced Platform Dwell Management



Enhanced Train Service



Rail Industry Challenges and MTR's Experiences

Asset Aging

Railways have low investment return and many operators in the world can lack funding for upkeep and upgrade - MTR's asset management and sustainable financial model enable well-planned asset upgrade to enhance customer experiences



Extensive Interface Work for New Extension Projects



\$3.3 Billion to upgrade signalling for DUAT Lines



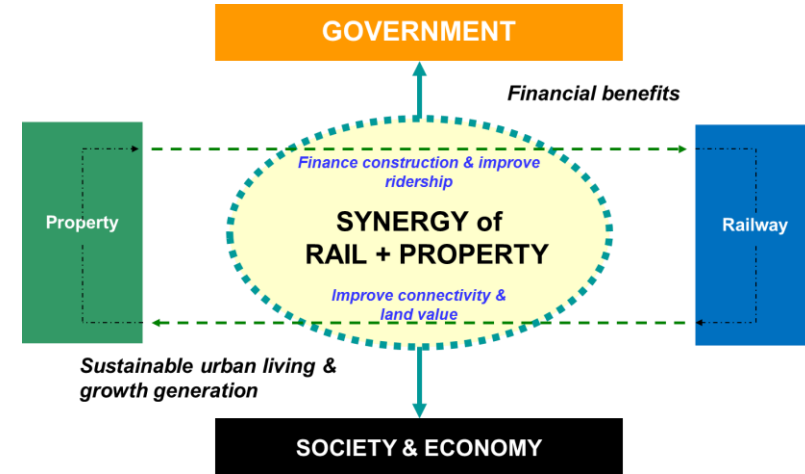
\$6 Billion for 93 new 8-car trains for Urban Lines



Over \$2 Billion for other major asset replacements and upgrades, e.g. CCTV, chillers, escalator, track circuit, PIDS, etc.



Replacement programme for Light Rail Vehicles to enhance service at North West New Territories



Thank you

Looking forward to more sharing of
good practices and experiences among all in IRSC



**27th International
Railway Safety Council
2017**



Good Safety Performance and Management

proved by independent reviewer – List of 29 Industry Leading Effective Practices (1 of 3)

No.	Category	Practice
1	Infrastructure Maintenance & Inspection	A critical risk to any rail system is the potential for degraded or failed track infrastructure. Despite progressive maintenance regiments, the possibility of a broken rail or other infrastructure related defect may develop quickly. Ensuring Train Captains can identify and report track infrastructure anomalies provides another layer of protection in the form of early reporting. To optimize this opportunity, MTR introduces <u>rail failures into its simulator scenarios</u> primarily through audible means. <u>Train Captains are taught</u> to recognize and report rail anomalies comprehensively through this method.
2		<u>Rail Assure</u> features an <u>integrated parts re-ordering algorithm</u> to eliminate stock-outs based on anticipated supply lead times and consumption rates. This is a valuable feature that contributes to successful asset management.
3		MTR is committed to following <u>ISO 55001</u> as the guiding standard for asset management within the corporation, and undergoes a regular 3-year certification audit to ensure compliance. It has reissued the Asset Management Manual in late 2014 to align with ISO 55001.
4	Vehicle Maintenance Inspection & Repair	MTR continues place a <u>high priority on Asset Management within the Rolling Stock section</u> . They continue to mature their Asset Management resources commensurate and scaled to emerging technology, and expanding fleet.
5	Training & Certification	To <u>assist new staff</u> , MTR has adopted a protocol that requires the use of the word 'super' as a <u>prefix in radio communications</u> , so that whoever they are speaking to knows that this person has less than 3 years' experience and to pay extra attention to what is being reported and communicated back. New staff also <u>get training and on-the-job support from a mentor for a period of about 2 weeks as well as on-going training</u> .
6		New hire <u>Train Captains</u> are on probation for nine months. During that time, they receive supervisory check rides and monthly evaluations from the managers. If they are not progressing as expected their probation can be extended for up to three years. If the probation is extended the new hire placed into a " <u>Caring Program</u> " and receives special attention to ensure their safety skills and operating proficiencies progress to the point where they can be released from probation. The Caring Program is another way MTR demonstrates the value they place on the success of their employees.
7		Requiring <u>candidates for the Controller position</u> to undergo a <u>scenario-based aptitude test</u> is a very effective way to evaluate candidates who will be working in a high stress environment.
8	Emergency	<u>AEDs in all stations</u> and thus far eight lives have been saved through their use.
9	Response Planning	MTR has established a robust <u>emergency protocol that include training all the shop owners and their staff</u> in evacuation procedures, evacuation meeting locations, and regular emergency drills to test and verify knowledge and competencies of all affected partners in these areas.
10	Workplace Safety Programs	MTR is very concerned about the Silver Tsunami arriving in 2018 when a significant percentage of its management staff will leave the agency. In fact, today 30% of MTR managers have three years of less seniority. To assist in the maturing and experience base of this influx of staff a Competency Development Team has been created. This team has designed a very thorough and comprehensive approach to provide quick learning platform and drive initiatives for continuous improvement. Quick learning publications with follow-up lessons to employees, monthly tutorials, on-line lessons learned are posted on the Knowledge Mall and a <u>Star Quality Index (SQI)</u> are just some of the tools that have been developed to assist in development of and measure the knowledge of these new managers. The SQI is a critical process assessment tool that <u>comprehensively evaluates twelve critical processes for all disciplines</u> . The evaluations are reported monthly to senior management.
11		Control introduced a <u>procedure to prevent staff or contractors going onto the track before current is switched off</u> by requiring a code to open a local key box.
12		NATSA commends MTR in its development of means and methods that allows for <u>efficient and safe installation and testing of a new signal system</u> within the narrow NTH window, while maintaining existing levels of reliable service each day.

Good Safety Performance and Management

proved by independent reviewer – List of 29 Industry Leading Effective Practices (2 of 3)

No.	Category	Practice
13	Passenger & Public Safety Programs	<u>Safety promotions</u> are developed and carried out for customers. The primary focus is on <u>escalator safety</u> , fire safety and light rail customer/pedestrian safety. Escalator incidents worldwide are tracked for information sharing and lessons learned. Engineered solutions are pursued including developing a higher level of attention with audible warnings at top and bottom of escalators, lighting highlighting the ends of escalators and with the high visibility colored handrails. This is further enhanced with the Escalator Safety Ambassadors although they are mainly deployed during peak times.
14		<u>Escalator safety has significantly improved</u> from a period of 2012 to 2016. Escalator accidents / incidents have been reduced by 37%, 962 down to 602 as a result of <u>creative safety awareness initiatives and promotions</u> . In addition, hand rail visibility and escalator stair footprint markings have help reinforce desired passenger riding habits.
15		Operational strategies such as the <u>introduction of “silver bullet” trains</u> (empty trains operating from the depots directly to the busiest stations without stopping at the intermediate stations) has helped significantly with controlling the crowding conditions at the affected stations. The implementation of <u>Inflow Control Action (ICA) and Super Inflow Control Action (SICA)</u> process when incidents occur, which restricts the influx of passengers onto a platform by locking 30% (for ICA) or 50% (for SICA) of the fare gates is another effective and practical solution to prevent overloading the platforms.
16		The routine inspections of the shops by station staff and the Marketing department serve as a risk mitigation measure to assure that the shops are maintained in accordance with MTR’s requirements, are free of hazards and do not obstruct and operation of fire/life safety equipment, such as the shop’s fire doors. <u>In addition to the periodic inspections, the annual inspection by the Station Manager of all the shops</u> within his/her area of responsibility is an indication that MTR places a high degree of accountability for safety at the top levels of the organization – not just on paper but also in practice.
17		Every MTR station has developed their respective <u>Crowd Control Plan</u> . The plans are <u>documented and drills are conducted</u> on a scheduled basis. Additional staff are normally utilized during peak travel times and thus available in case overcrowding occurs.
18		<u>Measures implemented to control the capacity constraints, particularly at critical NCO stations</u> that include Congestion Control Plans, deployment of station attendants at every PSD (x38) on the critical platforms to control crowds (with PA, Stop Boards & whistle) and minimize dwell times, monitoring of crowding trigger points, channelization of customer traffic flow to avoid conflicts through the use of portable mill barriers, readjustment of train schedules by request of the Station Controller who can monitor the train service and respond to updates from the SA on the platform, with utilization of scheduled empty trains and ‘silver bullet’ trains as and when required during the peak hours with daily crowd management reports are effective in minimizing delays for customers and controlling the capacity constraints to as low as reasonably practicable (ALARP).
19		The <u>establishment of a NCO Steering Committee</u> chaired by the Chief of Operating meets every 2 months to oversee all NCO issues at a system-wide level. The committee structure affords an avenue for Managers to discuss proposed strategies to address NCO issues unique to their respective lines and share best practices between each other.
20		The <u>organization of the OCC with dedicated teams to control train movement, communications, and traction power</u> affords an effective span of control and monitoring to be maintained over critical tasks. This structure also allows the Traffic Controller to focus on stations experiencing NCO.

Good Safety Performance and Management

proved by independent reviewer – List of 29 Industry Leading Effective Practices (3 of 3)

No.	Category	Practice
21	Rail Corridor Operational Safety	MTR has been <u>addressing the challenge of individuals jumping on the right of way track to commit suicide</u> on the East Line which does not have the benefit of platform screen doors. Thirty incidents of suspected suicides have occurred in the last five years, with an increase from 4 in 2015 to 9 incidents in 2016. Analysis showed where the hot spot locations were and mitigations included suicide prevention training for staff, partnership with the Samaritans, Emotional first aid counters, giant wall posters, posters placed at strategic locations, suicide prevention patrols etc. Resulted in 10 cases of suicide being prevented in 2016.
22	Hazard Management Process	All <u>maintenance employees are encouraged to ride the system</u> and if they notice a safety or equipment issue they will use the ISPOTIT app to report the issue. The app enables the employee to take photos and identify the exact car or equipment. This app provides hundreds of experienced maintenance personnel to be the eyes and ears of the agency out on the system.
23		MTR continues to utilize a prioritization process of capital projects that rely on a <u>Value Assessment process</u> incorporating specified criteria and weighted rating methodology. Projects are ranked V1 (best) to V4 (worst). High ranking projects (V1 and V2) would be ones that are “ready to go” or committed from prior year, and have gone through a voluntary “Asset Replacement Study”. A final list of projects is ranked by an independent team.
24		The <u>integrated planning approach</u> used by MTR to generate clear service requirements documentation, in coordination with the HK government, operating departments and community stakeholders is commendable/
25		MTR continues to encourage its staff members to report unsafe conditions through conventional means but has also introduced a <u>streamlined technology based reporting system utilizing a cellular phone Application</u> . The iSPOTit APP allows staff to transmit a brief description and photo of a hazard which is quickly disseminated to the appropriate facility landlord. The application allows for less subjectivity in the nature of the hazard. NATSA commends MTR in this initiative and considers the application an Industry Leading Effective Practice.
26	Accident Incident Reporting	<u>Displaying the time elapsed on the large clock in OCC</u> from the start of an incident along with the actions that need to be taken is an excellent mechanism to assure that critical steps for incident management, during high levels of stress, are performed in a timely manner.
27	Loss Prevention and Control	The organizational intent of this new office (<u>WMO</u>), with a team of 12 technical staff, is <u>to ensure minimal conflicts between implementation of concurrent mega projects into existing operations</u> , is well suited to manage this challenging issue. The NATSA team is not aware of other transit agencies that have made the level of investment in resources as MTR has for such projects.
28	Internal Safety Management Assessment	MTR has developed <u>an aggressive and efficient succession planning process</u> to address the loss of approximately one third of the management team in the next five years. A projected timeline of five to ten years is used and a <u>Talent Farming</u> process is initiated to select two to three candidates for each management position that will be vacated as a result of retirement. A career development and training plan has been developed and the candidates are cross trained in all departments. Candidates showing promise in specific disciplines are provided additional training and encourage to apply for an opening when one occurs. This investment in time spent training with incumbents and cross training will ensure the retention of safety and operational knowledge.
29		MTR is undergoing a high level of turnover in key areas of the organization. This is primarily due to retirements. MTR continue to apply best practices with regard to succession planning. A specific example of this was presented to the team in our interview with the Head of Workshops (Kim Hung Lee) who recently moved into this position. As part of the transition, the former Head of Workshops worked alongside for several months. Similarly, the new Head of Workshops also spent a percentage of this time coaching his replacement. NATSA has commended MTR for its progressive human resource management schemes in the past, but wanted to note this live example experienced in our interviews.