



Entering High Speed Rail Era

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Connections to the Mainland



Legend
 — "8 Verticals, 8 Horizontals" National High-speed Rail Map
 — 8 Verticals — 8 Horizontals — Guangzhou-Shenzhen-Hong Kong Express Rail Link

- 4 North-South Corridors and 4 East West Corridors (四縱四橫) Plan completed
- Over 26,000km National High-speed Rail Network
- Next Stage: 8 North-South Corridors and 8 East-West Corridors (八縱八橫)
- Total length of 38,000km in Year 2025

*Source of information: Transport and Housing Bureau

High Speed Rail in Hong Kong

- 11-hectare underground station at West Kowloon
- 6 tracks for short-haul trains (8-car) & 9 tracks for long-haul trains (16-car)
- All tracks in HK section in tunnels
- Operation Control Centre (OCC) and train stabling, routine cleaning & light maintenance at Shek Kong Stabling Sidings (SSS)
- Emergency escape exit for passengers and access for rescue teams at Emergency Rescue Siding (ERS)



Business Overview



Patronage

- Carried 650,000 passengers during National Day Holiday Period(國慶黃金周)
- Accumulated patronage around 1.6 million
- Golden Week 2018 (29/9-7/10)
 - Mainlanders (76.5%) / HK residents (21.0 %) / Overseas (2.5%)
- Tour Groups



Train Pairs

- 23/9 to 25/10 2018
 - 70 shuttle + 13 long haul for weekdays
 - 82 shuttle + 13 long haul for weekend
- 26/10/2018 onwards
 - 70 shuttle + 13 long haul for weekdays
 - 79 shuttle + 13 long haul for weekend

High Speed Train in Hong Kong

- Nine 8-car high-speed trains based on Mainland CRH380A model
- Designed & manufactured by CRRC Qingdao Sifang (中車青島四方)
- Maximum design speed of 380km/h (max. operating speed of 200km/h in HK tunnels)
- 2 trailer cars & 6 motor cars (6M2T), with 579 seats (plus 2 wheelchair seats)



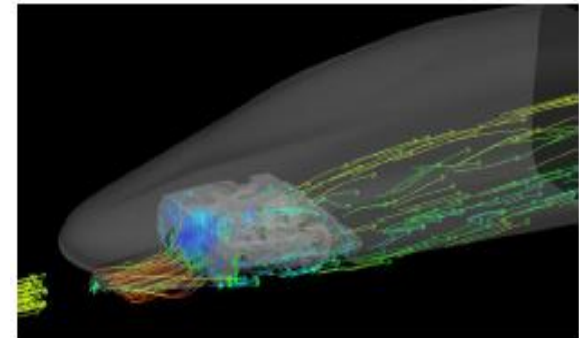
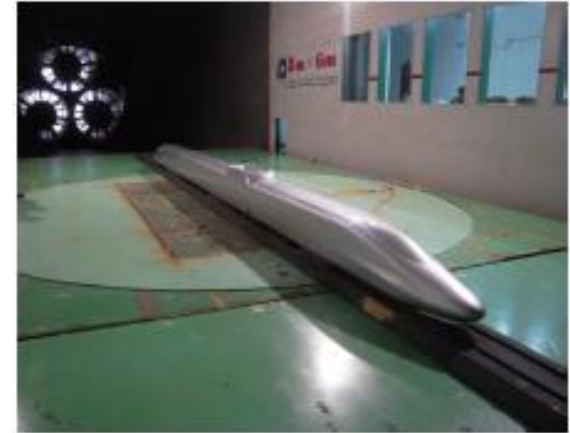
High Speed Train Design – Aluminum Alloy Carbody

- Characteristics :
 - Aluminum alloy construction
 - Widely use on high-speed trains with operating speed above 300km/h
 - Light weight with required strength (reduce mechanical resistance → energy saving)



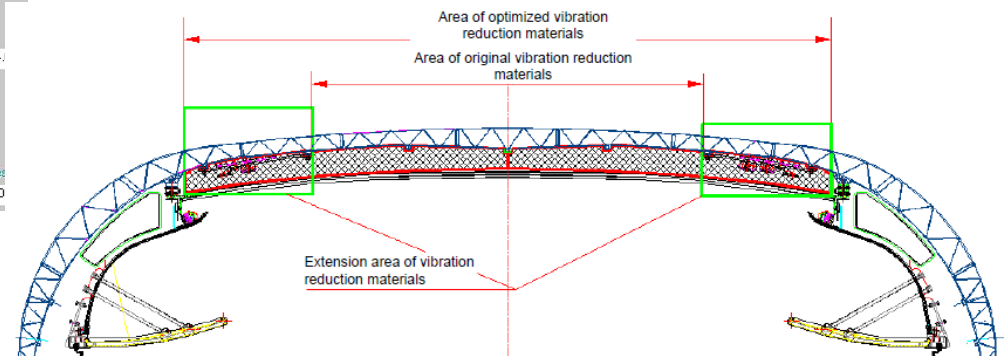
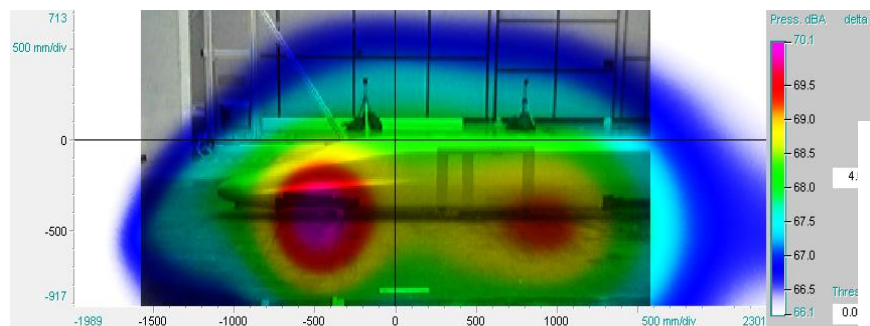
High Speed Train Design – Streamlined Head Shape

- Aerodynamic design is critical
 - Running resistance
 - Stability
 - Ride comfort
- Design & test train head shape by
 - Computer simulation
 - Wind tunnel test
- Other streamlined design:
 - Pantograph
 - Underframe equipment
 - Bodyside doors
- Benefits :
 - Reduction of aerodynamic resistance
 - Noise reduction



High-speed Train Design – Vibration and Noise Control

- Exterior noise :
 - Streamlined head shape and other exterior components reduce aerodynamic drag and smoothen the air flow
 - Straight track reduce wheel-rail noise compared to curves
- Interior noise :
 - Control on major noise sources (e.g. traction transformer, air-conditioning)
 - Selection of acoustic insulation and absorption materials



Major difference between HSR and Metro on Operation & Maintenance of Key Railway Operations Systems

	HSR	Metro
Ownership	HSR owned by Hong Kong Government	Existing line owned by MTR
System Maintenance by Engineering vehicle	<ul style="list-style-type: none"> - Comprehensive Inspection Train (CIT) - Ultrasonic Inspection Vehicle (UIV) - Rail Grinding Vehicle (RGV) - Overhead line Inspection Vehicle (OIV) 	<ul style="list-style-type: none"> - Ultrasonic Train Vehicle (UTV) - Rail Grinding Vehicle (RGV) - Overhead line Inspection Vehicle (OIV)
Maintenance Manpower	<ul style="list-style-type: none"> - Outsourced + In-house 	<ul style="list-style-type: none"> - In-house
Maintenance standard / Rules	<ul style="list-style-type: none"> - Rules issued by China Railway Corporation 	<ul style="list-style-type: none"> - O&M manuals - Existing Procedures and Work Instructions - BS/EN Standards
Maintenance complexity	<ul style="list-style-type: none"> - Corporate with China's operator - Maintenance arrangement at cross boundary 	<ul style="list-style-type: none"> - Arranged internally
Safety Rules & Engineering possession	<ul style="list-style-type: none"> - 《行車組織細則》 - 《施工管理細則》 - “行车不上道,上道不行车” - “天窗”is required for maintenance and agreed with mainland counterpart 	<ul style="list-style-type: none"> - Railway Safety Rules (RSR) - “Engineering Possession” is required for maintenance and to be authorized by internal staff.

Major Drills and Exercises

Major Drills involving MTR and Mainland counterparts were completed before opening:

- Overhead Line Wire Dewirement
- Train Rerailment
- Train Rescue by Assisting Trains / Locomotives
- Train on Fire in Tunnel
- Station on Fire
- Access to Train Roof



Learning and developing technology of HSR



Regular liaison with China Academy Of Railway Sciences (CARS)

- To exchange and share the experiences and knowledge in maintaining a railway system.
- To appreciate the latest technological development and innovation in China.
- To co-learn and co-create new technologies and practices.



Special Maintenance Equipment Wheel Monitoring System - LD

- **What is LD?**
 - “Drive-through inspection system” installed on tracks
 - When a rolling stock passes by, key parameters and defects of wheel sets are automatically inspected
 - Installed at Shunt Neck Track in SSS
- **Three Major Systems**
 - Laser check
 - Wheel flat check
 - Phased array ultrasonic (PA)
- **Advantages:**
 - Identify defects by analysing inspection data
 - Monitor wheel condition quickly and reliably
 - Improve maintainability and safety
- **Frequency of Monitoring:**
 - Perform wheel monitoring per train once every two days
 - Calibration once a year

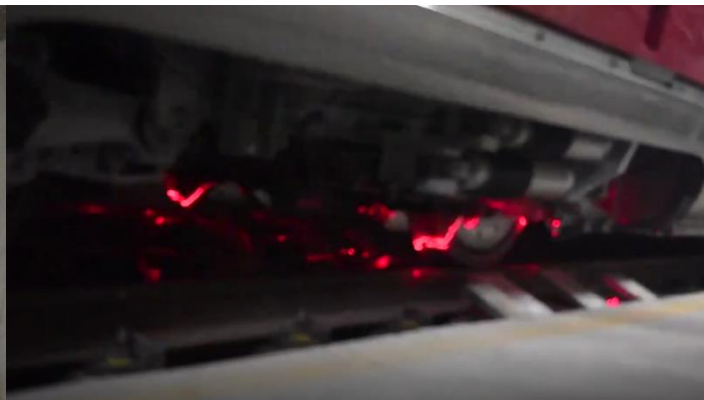
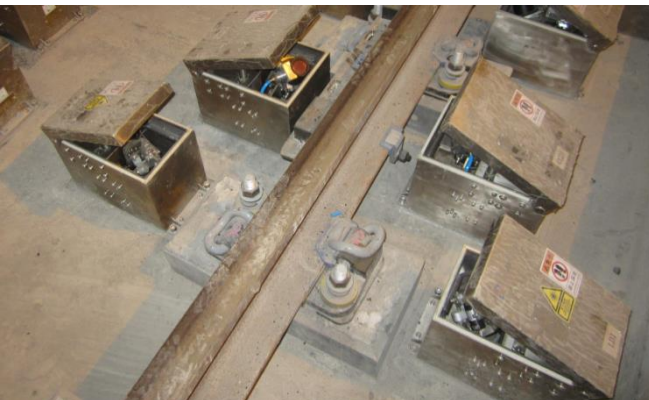
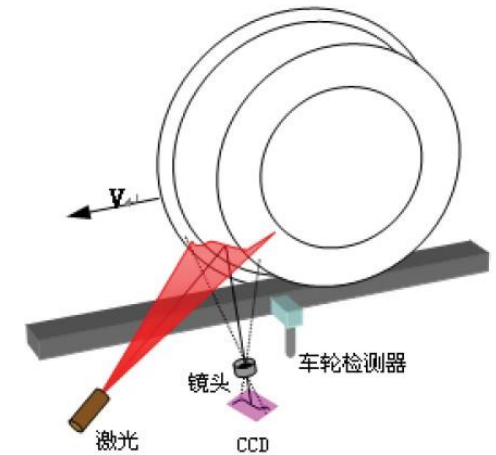


▲ *WMS as the doctor of train equipment*

Special Maintenance Equipment

Wheel Monitoring System - LD

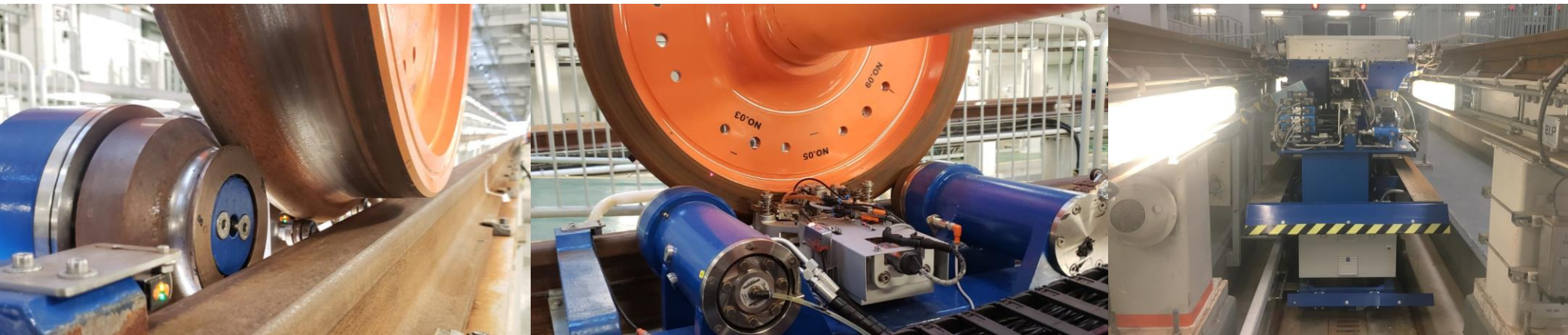
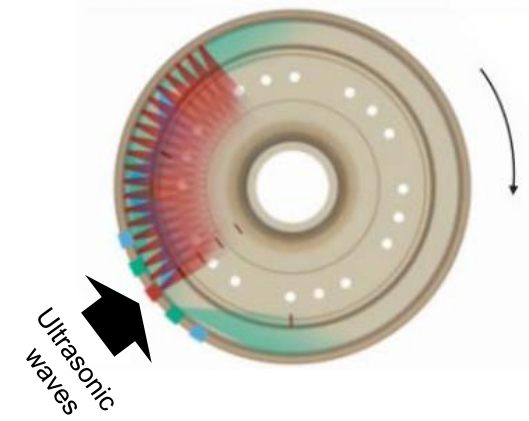
- **Highlight: Laser Check**
 - Wheel diameter & profile, flange height & width and back-to-back spacing can be determined with the use of light-section method (光截圖像測量技術)
- **Working Principle:**
 - Red laser beams are projected on the wheel surfaces
 - Projection of laser beams shows the wheel profile
 - Photos of wheel profile are taken by CCD cameras
 - Data are analyzed by computer



Special Maintenance Equipment

Underfloor Wheelset Testing – LU

- **LU (移動式輪輞輪輻探傷系統):**
 - Movable underfloor ultrasonic inspection equipment
 - Wheel rim and disk inspection
 - Phased array ultrasonic (PA)
- **Working Principle:**
 - Automated robot moves beneath the train toward the wheelset
 - Grip and rotate the wheelset
 - PA probe examines the wheel while it revolves
 - Examine one wheelset each time



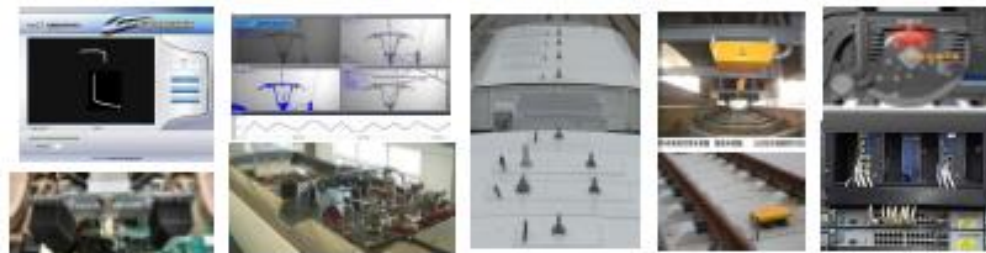
Comprehensive Inspection Train (CIT)

综合检测列车

- CIT was constructed base on the CRH EMU platform with different kinds of specialized equipment including track, Overhead line, telecom and signal checking devices



CRH380AJ-0201高速综合检测列车



轨道检测

接触网检测

通信检测

信号检测

综合系统

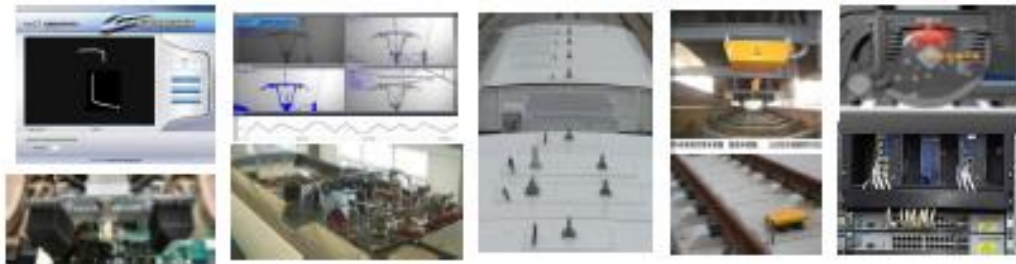


Comprehensive Inspection Train (CIT)

综合检测列车



CRH380AJ-0201高速综合检测列车



轨道检测

接触网检测

通信检测

信号检测

综合系统

香港段检测标准

TB/T3355-2014

TG/XH102-2015

科技运〔2010〕21号

TJ/DW139B-2014

铁运〔2012〕211号

TB/T3287-2013

TB10430-2014

TG/TX106-2014

TG/GD124-2015

运供设备函〔2016〕283号

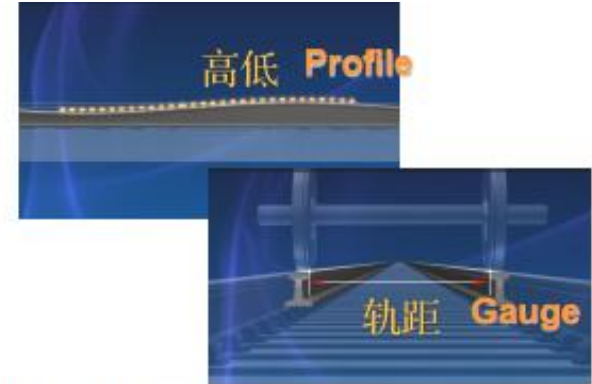
Comprehensive Inspection Train (CIT)

综合检测列车

Track inspection



- 轨距 Gauge
- 轨距变化率 Gauge rate
- 轨向 Alignment
- 高低 Profile
- 超高 Superelevation
- 水平 Cross-level
- 三角坑 Twist
- 曲线半径 Curvature



- 曲率变化率 Curvature rate
- 车体横向加速度 Car body lateral acceleration
- 车体垂向加速度 Car body vertical acceleration

采用接触式、非接触式两种测量方式;



← Overhead Line inspection

Comprehensive Inspection Train (CIT)

综合检测列车

实现了GSM-R移动通信和450MHz无线场强覆盖、GSM-R通信服务质量、沿线电磁环境等测试功能。

Telecom inspection 

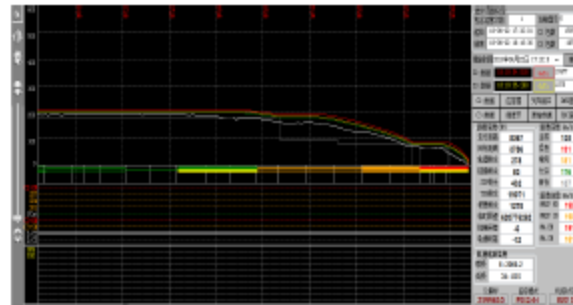
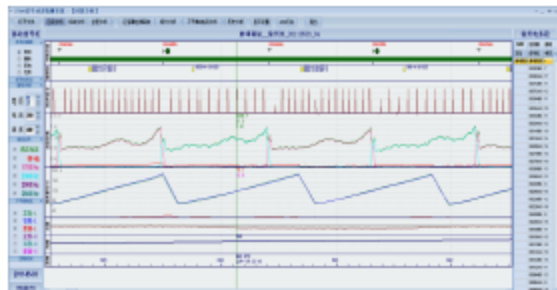


通信检测系统



检测天线

轨道电路、补偿电容、牵引回流检测界面



车载ATP运行数据监测界面

 Signal inspection

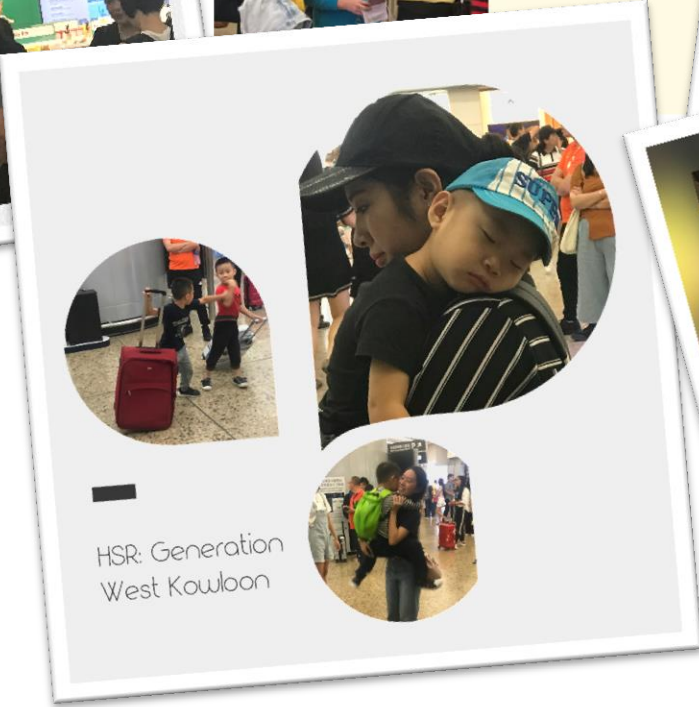
35 Shops



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Happy Faces ... Families & Friends



An Exciting Journey : **GO速! GO更遠!**

3/8/2018
Safe & Sound Declaration



1-2/9/2018
WEK Open Day



22/9/2018
Opening Ceremony
「廣州-香港」
MTR 港珠澳(西港段)開通儀式
Opening Ceremony
「Guangzhou - Hong Kong」
MTR West Kowloon -
Hong Kong High-Speed Rail Link
Opening Ceremony



10-19/9/2018
Ticket pre-sale



23/9/2018
HSR Day 1 Opening

