Progress Update on Upgrading Signalling System for Railway Lines

LegCo Subcommittee on Matters Relating to Railways
Apr 2021

MTR Corporation Limited 香港鐵路有限公司

Signalling System Upgrade Project

Upgrade the signalling systems of **SEVEN** railway lines

➡ Increase **reliability** and **overall carrying capacity**

Tsuen Wan Line

Kwun Tong Line

Island Line

Tseung Kwan O Line

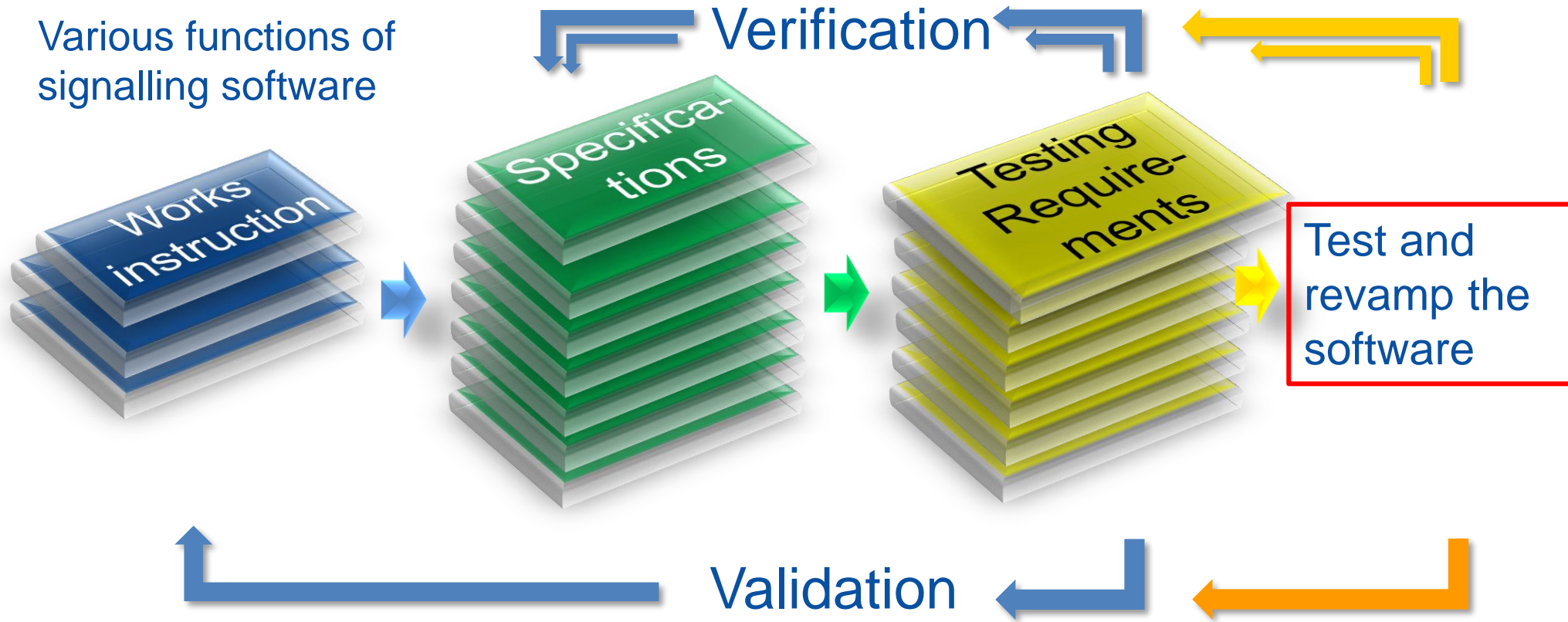Disneyland Resort Line

Tung Chung Line

Airport Express

Project Progress

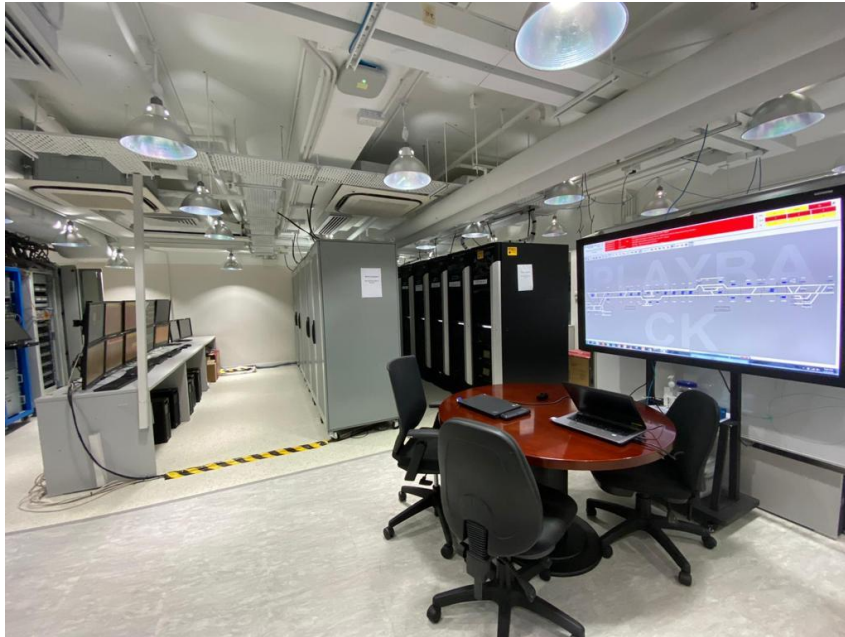|	Working items	Status
1	Replace the software design and development team	**Completed**
2	Construct a completely new revamping process for the signalling system software	**Completed**
3	MTR and the Contractor appoint independent consultants respectively to strengthen supervision and identify deficiencies timely	**Completed**
4	Generate more comprehensive and stringent requirements, specifications and testing requirements for "Train Speed Control" software, in accordance with the new revamping process and required artefacts of the signalling system software	**Completed**
5	Conduct verification, validation and testing based on the result of item 4, analysing the changes requested and optimizing the revamping process	**Almost completed**
6	Optimizing revamping process and revise necessary functions in the aforementioned "Train Speed Control" software	**Ongoing**
7	Verify and test other functions of the software such as "train position", "train routing", "automatic train protection" and "automatic train operation", etc.	**Ongoing**
8	Set up a new signalling system integrated testing platform in Tsing Yi station	**Ongoing**

New Software Development Process

Various functions of signalling software

Works instruction

Specifica-tions

Verification

Testing Require-ments

Test and revamp the software

Validation

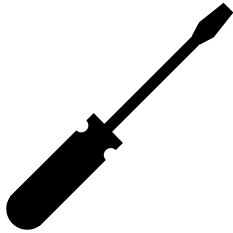Ensure software's safety and reliability

This procedure complies with " Railway applications —Software for railway control and protection systems" international standard (EN50128)

New Signalling System Integrated Testing Platform

A new signalling system integrated testing platform in Tsing Yi station – Installation and testing of hardware targeted to be completed in 2021 (photos for reference)

Factors Affecting Project Progress

High level of technical complexity

Strengthen current software review and testing work, with reference to East Rail Line's experience

Contractor's testing progress was adversely affected by the local pandemic situation

Urge the contractor to follow-up at full speed
Strive to recover the delay while ensuring safety and reliability

Recovery Measures

- **Safety and reliability - our primary concern**

  ✓ Enhance independent verification work – Contractor hired independent experts on software quality assurance in order to enhance software requirements, specification and testing for quality verification & validation works. Timely actions will be taken to identify and rectify deficiencies.

  ✓ Allocate extra resources – Contractor has expanded manpower and improve team composition to expedite the software revamping process and to ensure its effective execution

  ✓ Review work-flow – Carry out the review and improvement as planned. Will review and improve the process continuously

  ✓ Enhance work efficiency - Fully utilize the new signalling system integrated testing platform to effectively perform in-house tests for different operating scenarios

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Sequencing of Signalling System Upgrade Project

1- Tsuen Wan Line

3. Kwun Tong Line/
4.Tseung Kwan O Line
Will commence after the completion of the Island Line project

2 - Island Line
Will commence after the completion of the Tsuen Wan Line project

Signalling Upgrade – Preparation Work

Installation works for Island Line, Kwun Tong Line and Tseung Kwan O Line being carried out in parallel
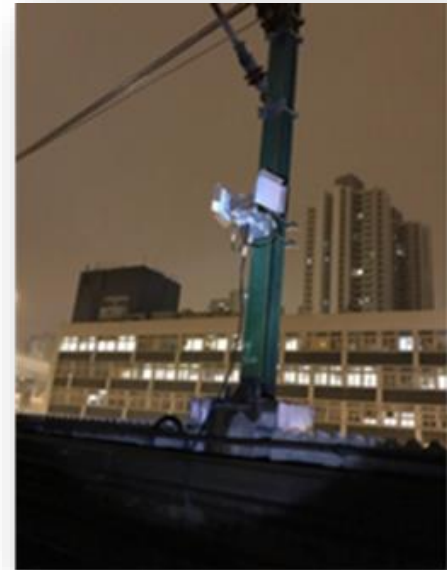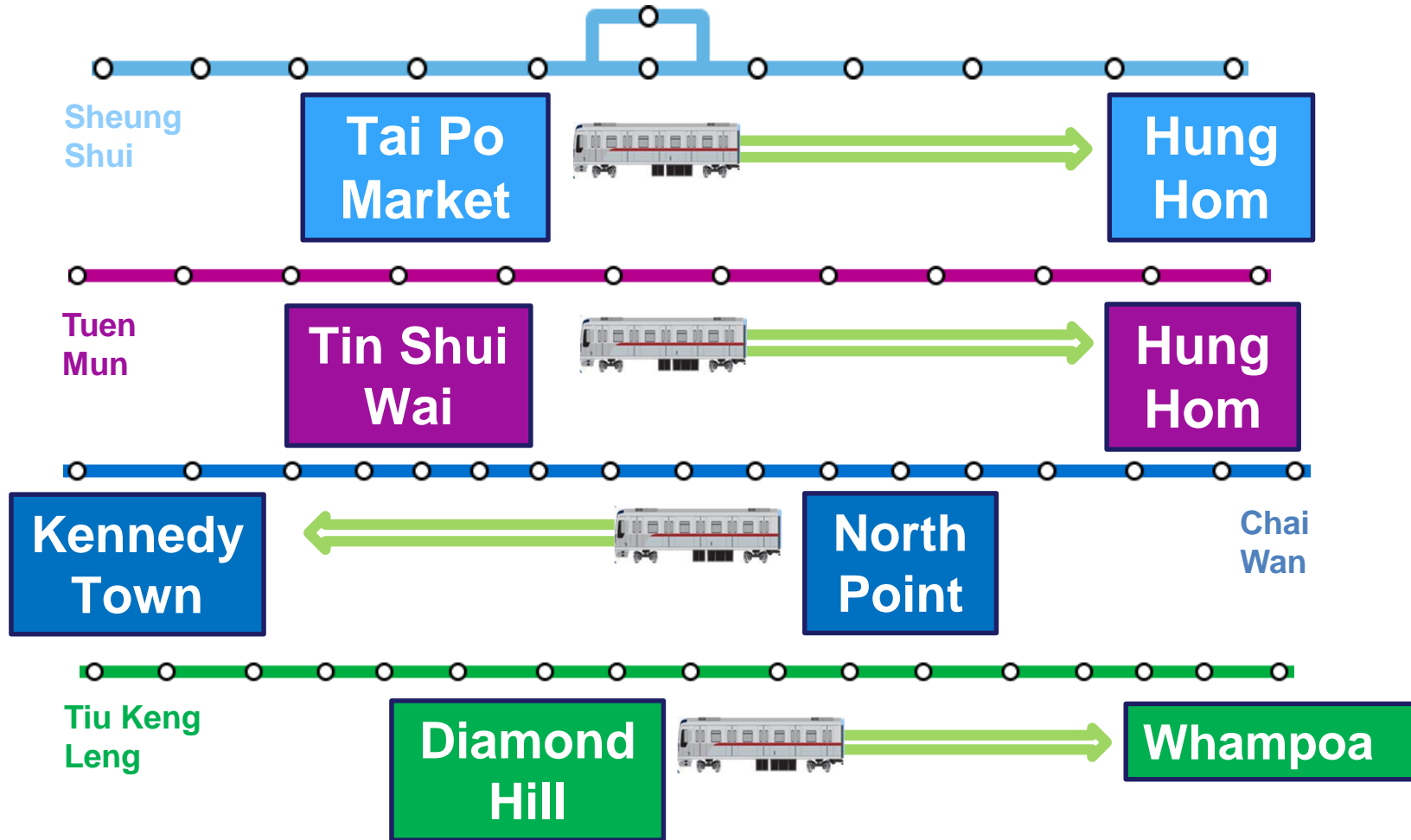

Setting up Equipment room

Laying Cable

Testing Components

Installing of Access points

Providing Short-haul Train Trips

Provide short-haul train trips based on actual demand, increasing carrying capacity

Sheung Shui — Tai Po Market → Hung Hom

Tuen Mun — Tin Shui Wai → Hung Hom

Kennedy Town ← North Point — Chai Wan

Tiu Keng Leng — Diamond Hill → Whampoa

Re-layout of Station Concourses

Revise concourse layout to smoothen passenger flow

- **Retrofit new staircases and lift connecting station concourse and platforms**

- **Relocate customer service centre**
- **Reposition ticket gates**

Kwun Tong

Tseung Kwan O

Sheung Shui

- **Construct an additional exit at Hung Hom-bound platform**
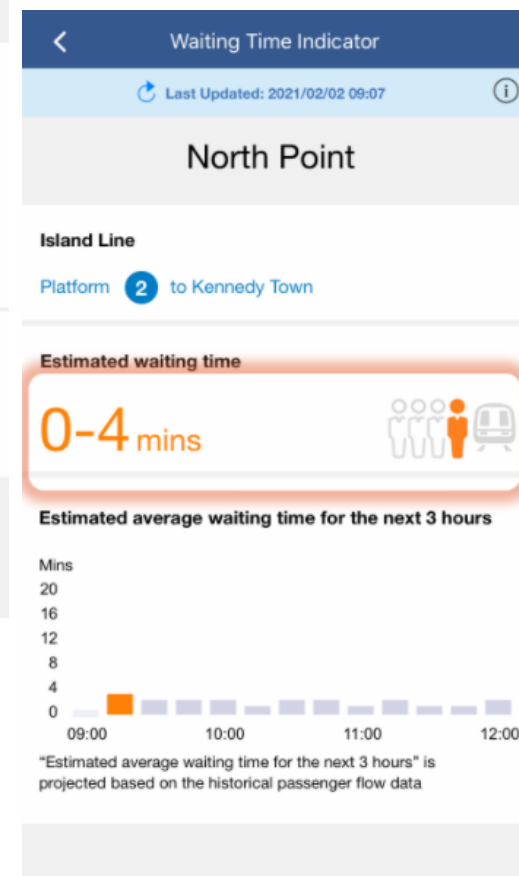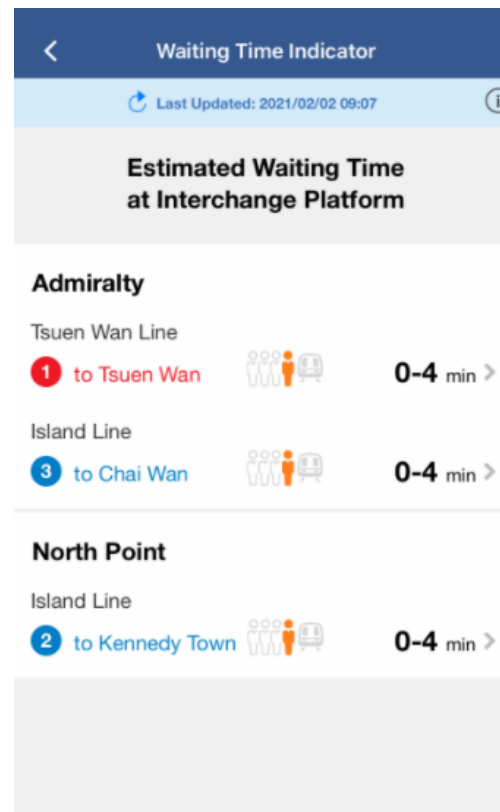- **Widen existing staircases**

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"Waiting Time Indicator" Function

Stations covered

- Admiralty (To Tsuen Wan)

- Admiralty (To Chai Wan)

- North Point (To Kennedy Town)

Stations to be covered in future

- Kowloon Tong

- Tai Wai

- Mong Kok

- Prince Edward

- Yau Tong

THANK YOU