路政署
HIGHWAYS DEPARTMENT

中華人民共和國香港特別行政區
Hong Kong Special Administrative Region of the People's Republic of China
25th 周年紀念 ANNIVERSARY

路政署創新科技
在道路建設和維護的應用

Building and Maintaining Highway Infrastructure through Innovation in Highways Department

引言
Introduction

建築信息模擬技術被廣泛應用於不同項目的勘查和初步設計階段中，其中包括中九龍幹線及十一號幹線項目。

Building Information Modelling (BIM) Technology is widely used in the investigation and preliminary design stages of different projects, including the Central Kowloon Route and Route 11 projects.

中九龍幹線概覽
Overall view of CKR

應用建築信息模擬技術的好處
Benefits of BIM application

採用建築信息模擬技術能在下列各方面提升及改善與不同持份者的溝通。

BIM is adopted in different projects to enhance and improve communication among various stakeholders in the following aspects.

施工可行性 Works Constructability

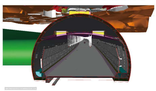
4D工程規劃可模擬實際的施工狀況以審視施工可行性，並確保建造方法能夠在工地實際環境順利進行。

4D phase planning simulates the actual working condition and review on the constructability of different construction methods under the actual site condition.

檢視拆卸隧道鑽挖機的施工可行性
Review of constructability of the Tunnel Boring Machine (TBM) dismantlement

檢視臨時填海工程的施工可行性
Review of constructability of the temporary reclamation works

工程的銜接和協調 Interface Coordination



使用建築信息模型製作的衝突分析
Implementation of clash analysis with BIM

不同範疇的工程團隊成員運用建築信息模型制定良好的設計方案，透過使用空間協調及衝突分析，加強工程團隊的溝通及加快工程的進度。

The project team members from different disciplines work collaboratively to produce a well-coordinated design solution with the help of BIM. It enhances the communication within the project team and expedites project delivery with the use of spatial coordination and clash analysis.

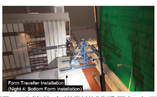
工地運用 Site Utilisation

各項工程的建造方法和工地要求均會於3D建築信息模型當中展示，確保能有效地使用工地資源及減少工料浪費。

Construction sequence and space requirements are visualised in the 3D model to optimise resources allocation and reduce site wastage.

拆卸油麻地停車場大廈及重置加士居道天橋的4D工程規劃模型
4D phase planning for demolition of Yau Ma Tei Carpark Building and re-provisioning of Gascoigne Road Flyover

工地安全 Site Safety



運用建築信息模型模擬重置加士居道天橋的施工流程
Simulating the construction sequence of re-provisioning the Gascoigne Road Flyover

工程團隊可利用3D模型及4D動畫協助即時識別潛在危險，以避免和減低潛在的安全風險。

3D models and 4D animations allow instant identification of potential hazards, which avoid and minimise potential safety risks.

數碼工程監察系統及管理 Digital Works Supervision and Management

中九龍幹線是首個採用綜合數碼工程監察系統(iDWSS)的工務工程，旨在將六個工程合約的監察數據轉載至一個綜合管理平台，並分析關鍵績效指標（KPI）數據，提高施工品質、安全和環境表現。

CKR is the first public works project with iDWSS developed to transform data from 6 contract-wide supervision platforms into 1 project-wide management platform, providing different Key Performance Index (KPI) data analysis to improve quality, safety and environmental performance in project implementation.

使用綜合數碼工程監察系統管理和監督建造工程
Using iDWSS to manage and supervise construction works

中九龍幹線的智慧工地管理平台
Smart Site Management Hub of CKR

資產管理 Asset Management

利用駕駛路線模型作交通管理
Drive-through model for traffic management

透過將營運及保養部門的資產信息要求 (AIR) 納入建築信息模型，工程團隊可以審視營運及保養程序的要求，從而提高可持續發展評估的效率、竣工紀錄管理、保養時間編排、空間利用管理，並協助分析系統的能源表現。

The Asset Information Requirements (AIR) of the O&M parties are being reviewed and incorporated into the BIM model, which enhances the efficiency of sustainability evaluation, management of as-built records, maintenance scheduling, space utilisation management. In addition, it facilitates energy analysis on system performance.

卓越的服務 Operational and Service Excellence

建築信息模擬將工程團隊、工作流程及數據連結起來，以達致節省成本和時間、提高工地安全及可持續發展的目標，提升建築工程的質素。

BIM enhances the quality of the construction works by saving cost and time, improving safety performance and achieving sustainability.

中九龍幹線啟德通風大樓及行政大樓的建築信息模擬效果圖
BIM rendering of CKR Kai Tak Ventilation and Administration Building

於十一號幹線（元朗至北大嶼山段）勘察研究中的應用
Application of BIM in Route 11 (section between Yuen Long and North Lantau) Investigation

背景資料和研究
Background data and research

地形、水深和地質模型
Topographic, bathymetric and geological modelling

結構模型
Structural modelling

工地限制資料
Site constraints data

建立現有環境狀態模型
Existing condition modelling

初步設計發展
Preliminary design development

避開限制 +碰撞偵測
Avoiding constraints + clash detection

整體結構分析
Global structural analysis

風荷載下的結構分析
Wind analysis

建築信息模型
BIM model

建築信息整合模型 (包含四維施工程序)
Federated BIM model (with 4D construction sequencing)

公眾參與
Stakeholder engagement

猶如身臨其境的虛擬體驗
Immersive virtual experience

三維互動駕駛體驗
3D interactive driving experience

三維互動海上航行體驗
3D interactive sailing experience