

COMPANY  
Civil Engineering and Development  
Department, HKSAR Government /  
AECOM Asia Company Limited

PROJECT  
Widening of Tai Po Road (Sha Tin Section) –  
Design and Construction

LOCATION  
Widening of Tai Po Road (Sha Tin Section)

TYPE  
Infrastructure Works

# Visual Simulation Eases Design and Implementation of Road Widening Project



## About AECOM Asia Company Limited

AECOM is a global provider of professional technical and management support services to a broad range of markets, including the transportation, facility, environment, energy, water and government markets. With approximately 100,000 employees around the world, AECOM is a leader in all of the key industries that it serves.

AECOM is built to deliver a better world. We design, build, finance and operate infrastructure assets for governments, businesses and organisations in more than 150 countries. As a fully integrated firm, we connect knowledge and experience across our global network of experts to help clients solve their most complex challenges. From high-performance buildings and infrastructure, to resilient communities and environments, to stable and secure nations, our work is transformative, differentiated and vital.

## Project Description

The objective was to carry out the detailed design of the proposed road widening works of a 1.1 km section of Tai Po Road (between Fo Tan Road and Sha Tin Rural Committee Road) from dual 2-lane to dual 3-lane carriageway to cope with the anticipated traffic demand. The design included the noise mitigation measures to minimise the traffic noise impact to the nearby residents.

## Project Challenges

The major challenge of the project was to carry out construction works along a congested and highly demanded road. The project shall be completed in a satisfactory manner to hand over the works to the relevant departments/agents for maintenance and operation while also taking care of the safety and health of the construction workers and the general public. The project should be completed in a timely and cost effective manner throughout the design and construction works.

## Solutions for challenges

AECOM Innovative Solutions Department produced a 4D model for the design of the project, using BIM to resolve design and anticipated construction challenges. BIM was used to aid in the exploration of different design options, the easy communication of design intent with the public with photorealistic renderings, the scheduling of construction the sequences, and the identification of design clashes. BIM allowed the project team to fully coordinate the 4D model in the design phase.

## How does BIM benefit the project?

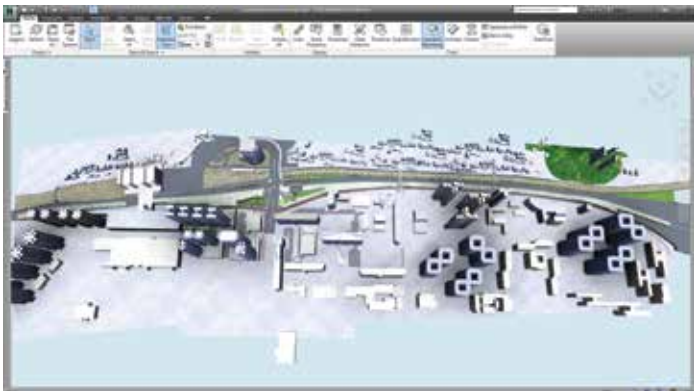
The project team completed a virtual model that included viewpoints for each individual clash and identified design issues in a fast and accurate manner. The 4D simulation allowed for more thoughtful planning of the construction sequences and phasing of access for specialised contractors. Realistic images were generated from the BIM model for ACABAS submission. Traditionally, designers take time to produce photomontages from fixed angles of view for ACABAS review, and when the angle of images is changed, it requires great cost and time for photomontage preparation. However, BIM enabled the creation of different realistic images from the models at any angle, and therefore dramatically improved the efficiency of submission preparation.

## Better with BIM

AECOM provides a blend of global reach, local knowledge, innovation and technical excellence in delivering solutions that create, enhance and sustain the world's built, natural, and social environments. The AECOM design team have rich collaboration experiences in large scale building and civil projects using BIM technology. BIM brings design visualisation that allows engineers to effectively review detailed design conflicts between multi-disciplinary designs in 3D views, therefore, BIM can improve design efficiency.



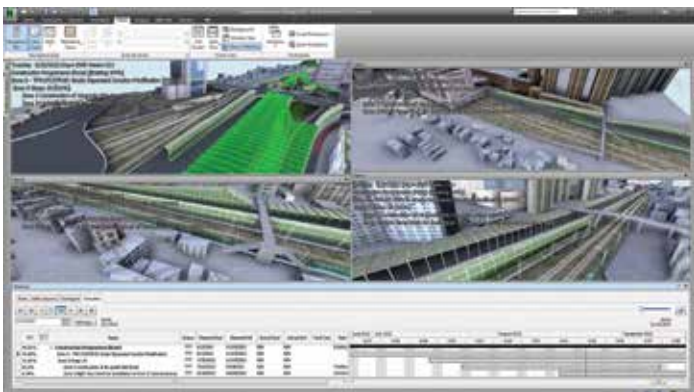
Widening of Tai Po Road (Sha Tin Section) Overview  
Image courtesy of Civil Engineering and Development Department, HKSAR Government and AECOM Asia Company Limited



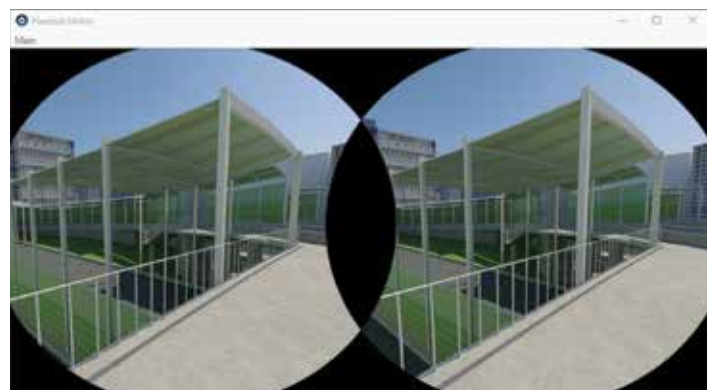
Civil Infrastructure BIM in Naviswork  
Image courtesy of Civil Engineering and Development Department, HKSAR Government and AECOM Asia Company Limited



VR Experience for the Proposed Design View 1.  
Image courtesy of Civil Engineering and Development Department, HKSAR Government and AECOM Asia Company Limited



4D Simulation with Project Programme  
Image courtesy of Civil Engineering and Development Department, HKSAR Government and AECOM Asia Company Limited



VR Experience for the Proposed Design View 3.  
Image courtesy of Civil Engineering and Development Department, HKSAR Government and AECOM Asia Company Limited