

# position

The Australasian magazine of surveying, mapping & geo-information

## BIM + GIS

Challenging the laws of infrastructure design



inside >



**Moonshot**  
Building space  
capability



**GDA2020**  
Tools to aid  
transition



**SEASC 2019**  
Developing  
links with Asia

# A quantum leap in infrastructure design

The BIM & GIS solution redefining possibilities for the AEC industry

It was early on a Tuesday morning at Mass Rapid Transport Corporation's (MRT Corp) headquarters in Kuala Lumpur when Aswadi Yusof, senior manager of planning and design, had just answered a query from one of the site engineers working on the Sungai Buloh-Serdang-Putraya Line (SSP Line). The call? A question regarding the proximity of a bore hole to an existing barrier wall at one of their construction sites. Normally, Aswadi would spend hours searching systems and looking through paperwork to find the answer. But on that Tuesday, for the first time, he could give a detailed and accurate response in just a few mouse clicks.

Aswadi and his team had just launched a new company-wide project management portal; an innovative system that integrated MRT Corp's Building Information Modelling (BIM) and GIS technologies. They now had just one system to view, analyse and manage all project data.

With complete oversight of all the project build sites in real-time, Aswadi could easily render a scene view showing the BIM structure design on the existing street map. Viewing detail including drone imagery of the current construction site, he was able to see the exact depth and progress of the bore hole in question and its distance from the barrier fence line. Aswadi answered his colleague's question with confidence and realised just how vast a difference this technology solution would make to the successful delivery of the SSP Line, as well as all future infrastructure projects.

## Breaking new ground in infrastructure design

The integration of BIM and GIS technologies is a capability that has been sought after for years, answering a need from architects, engineers and construction industry professionals alike for a single means to view accurate, detailed, and timely project information.

Operating in a multidisciplinary space can often cause frustration and delays in project delivery due to inherent breakdowns in communication, but through the seamless integration of BIM & GIS, all project data – such as building plans, renders, and imagery, as well as topographical, geological, structural, and environmental data – is displayed via one centralised portal that's accessible via any device.

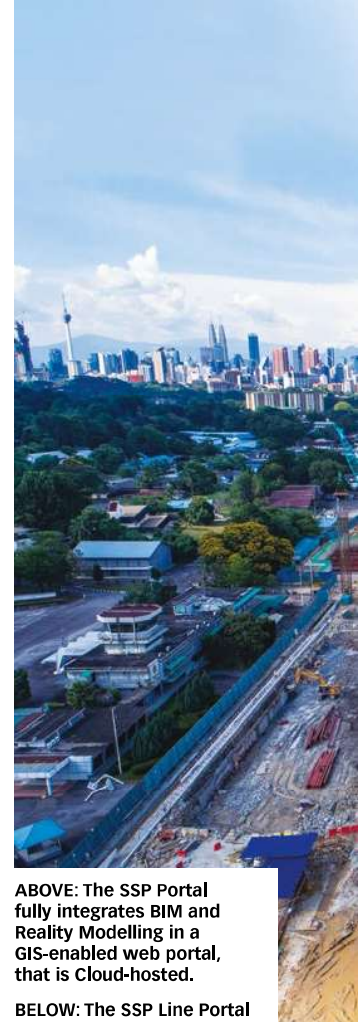
Placing BIM and GIS at the centre of construction projects drives smarter decisions, optimises designs, accelerates project approvals,

reduces costs and ultimately creates more considered and resilient infrastructure. The evidence of this lies in the transformative outcomes generated by groups such as MRT Corp.

Architecture, Engineering and Construction (AEC) industry lead for Esri Australia, Peter Wilmot, believes the outcomes MRT Corp has achieved with BIM and GIS will have a major impact on infrastructure project management.

"With the Australian construction industry contributing \$134.2 billion to the country's economy and developing rapidly, the AEC sector has a newfound reliance on innovative technology solutions to drive cost savings in major infrastructure project delivery," he said.

"The fusion of Autodesk and ArcGIS technologies empowers anyone involved in a project to make more informed decisions with absolute precision, not estimation. Combining BIM and GIS for construction projects integrates geographic data with real-time drone and sensor information to provide a deep virtual reality view, dramatically reducing risk of error or incident.



**ABOVE:** The SSP Portal fully integrates BIM and Reality Modelling in a GIS-enabled web portal, that is Cloud-hosted.

**BELOW:** The SSP Line Portal unifies the project's BIM information and reality models which are created monthly by merging the photos captured by an unmanned aerial vehicle.

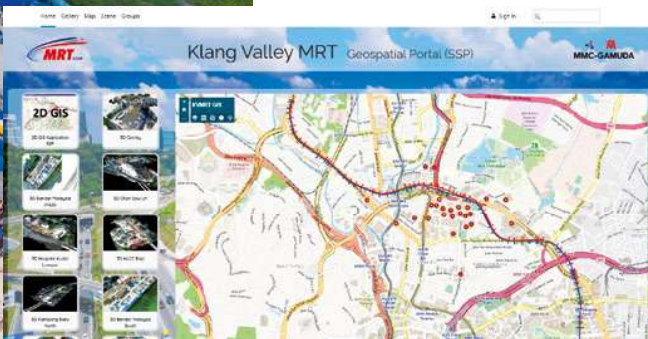
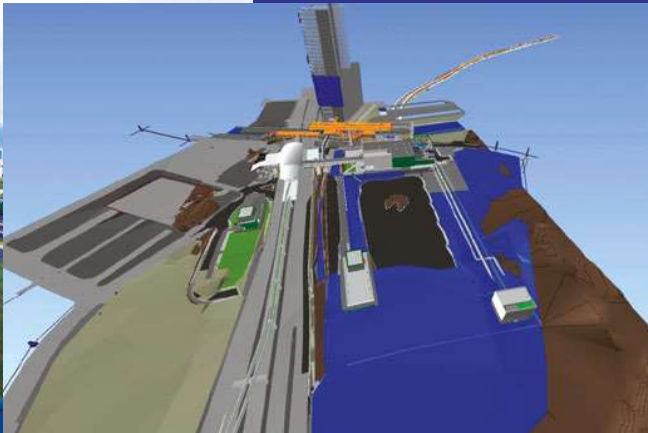
(Photos courtesy of MRT Corp.)



*"We have complete operational oversight on all build sites. The ability to render real-time scene views into geo-landscape imagery layers by bringing BIM into GIS means we can drill down to a granular level with precision accuracy, giving the confidence and trust to action decisions based on evidence."*

Aswadi Yusof, Senior Manager Planning & Design | MRT Corp





LEFT: 3D models from ArcGIS Portal with BIM layers can be retrieved directly from map viewer using a simplified interface pop-up.

BELOW LEFT: Esri 3D Scene Viewer is used to host MRT Corp's Reality Capture model. The output is made available through the GIS Portal for the project team to see the site progress virtually.

(Photos courtesy of MRT Corp).

“This BIM and GIS model will redefine the Australian AEC landscape. And given the high-profile nature of major projects like Brisbane Airport’s \$1.3 Billion expansion and the \$2.7 Billion Sydney CBD and South East Light Rail project, the reliance on software to ensure the on-time and on-budget delivery of projects will become even more prevalent.”

### MRT Corp’s BIM & GIS innovation

Traditionally, as with most large-scale construction projects, MRT Corp’s teams would have been operating in silos, switching between tech platforms. However, given the complexities around constructing the SSP Line, finding a more efficient solution was deemed essential.

By leveraging Autodesk’s BIM into Esri’s ArcGIS platform, MRT Corp created a cloud-based web GIS portal to house all project data. The platform is accessible to all stakeholders involved in the project, which is expected to service a corridor of over 2 million people with 52.2km of elevated and underground tracks and stations.

Aswadi Yusof said by introducing the solution, MRT Corp’s 500 site managers, architects, engineers and project managers could extract timely reporting, run predictive modelling, and provide accurate project management of incidents, permits and site details – for the first time.

“We now have complete operational oversight on all build sites,” he said. “The ability to render real-time scene views of station construction components or rail line models, into geo-landscape imagery layers means we can drill down to a granular level with precision accuracy, giving us the confidence and trust to action decisions based on evidence.”

“From field reporting components such as logging drilling progress, recording incidents, and storing site permits in a geotagged dynamic view, to real-time operational dashboards used to track project progress against benchmarks, MRT Corp has been able to replace cumbersome processes and eradicate the thousand-page paper reports that were previously used.”

**Solution Mix**

- + Autodesk BIM
- + ArcGIS Pro
- + ArcGIS Portal
- + ArcGIS Enterprise
- + ArcGIS Collector
- + Survey123 for ArcGIS
- + Esri 3D Scene Viewer
- + Cloud hosting

### Redefining the realm of possibilities

To date, MRT Corp’s integrated Autodesk and Esri solution to project management has increased productivity by over 35%, which – when compared to Australia’s standard productivity growth rate of 2.8%\* – clearly demonstrates why this innovation is a game changer for the AEC sector globally.

Peter Wilmot said solutions like those pioneered by MRT Corp will no doubt deliver new efficiencies to the Australian AEC industry by providing a solution to the challenges facing these multi-disciplinary major infrastructure projects.

“What I find most exciting about the work undertaken by MRT Corp, is that it can essentially serve as a blueprint for a best-practice solution for any organisation working on infrastructure development,” he said.

“Whether it’s building a cross-river transport network or creating a new smart city, BIM and GIS integration provides an unparalleled operational view that delivers evidence-based actionable insights.”

To speak with an AEC specialist about integrating BIM and GIS technologies on your next project, visit [esriaustralia.com.au/BIM](http://esriaustralia.com.au/BIM)

\* 2018 Defining the Australian Construction Industry report by Buildsoft.

Information provided by Esri Australia. ■