Bentley
Advancing Infrastructure

CASE STUDY

Building a New Bridge for Mumbai with Greater Transparency and Efficiency

Bentley Applications Helped Create a Comprehensive, Integrated Digital Platform to Save Commuters 45 Minutes Each Trip

CONNECTING MUMBAI

The Versova-Bandra Sea Link (VBSL) is an essential piece of Mumbai's new Western Coastal Road, an ambitious bridge expansion of the city's infrastructure that will link southern Mumbai to its western suburbs. The VBSL will connect the Versova neighborhood to the Bandra-Worli Sea Link, a bridge completed in 2010. The VBSL will have eight lanes and is projected to reduce travel time for Mumbai commuters by 45 minutes. Spanning 17.17 kilometers, it will be the second-longest bridge in India upon completion.

Maharashtra State Road Development Corporation (MSRDC) is overseeing the execution of the VBSL. To manage this process effectively, they required one central system that supported multiple functions: building information modeling (BIM), enterprise resource planning (ERP), business analytics systems (BAS), and geographic information systems (GIS). That central system needed to be fast, transparent, and reliable. MSRDC partnered with several organizations, including ABM Knowledgeware Ltd, to build and implement this system called Digital Project Management System (platform (DPMS).

NAVIGATING COMPLIANCE, COMMUNITY, AND CROSS-DISCIPLINE PARTNERSHIP

Delivering any project at the scale of the VBSL or the larger Western Coastal Road is a massive undertaking. Infrastructure professionals must be able to work quickly and efficiently with up-to-date information. This requires multiple cross-discipline partnerships and extensive coordination between stakeholders, as well as complex engineering.

Project Authority and project stakeholders had to overcome this complexity at multiple points while working on the VBSL. In the past, they had faced tedious—but serious—compliance obstacles. They needed to ensure that all the BIM models in their central platform were in order. It was equally important that those models be accessible and actionable to end users working on site. Because workers were executing numerous, complicated designs, they needed an intuitive platform that construction professionals could execute quickly and easily on the ground.

The VBSL also presented specific challenges regarding the environment and the community. Project Authority and project stakeholders, including ABM Knowledgeware, had to navigate complex tree-cutting permissions to build on-site. They also had to manage relationships with the local fishing industry, sharing marine access without disrupting the local economy. Project Authority and project teams had to understand the local requirements and communicate with their stakeholders that those requirements were being met.

CREATING A SINGLE SOURCE OF TRUTH

To deliver the VBSL, ABM Knowledgeware turned to Bentley Systems to create a digital project management system. This platform featured several Bentley applications: ProjectWise, AssetWise, and SYNCHRO, as well as asset-specific applications like OpenRoads Designer, OpenBridge Modeler®, and OpenBuilding Designer. ABM Knowledgeware consulted with Bentley's subsidiary Cohesive® on how to best integrate these applications. Together, Bentley, Cohesive, and MSRDC with its partners have built a secure and convenient digital platform (DPMS) for storing and sharing all the project-related information: a single source of truth.

ABM Knowledgeware used Bentley software to generate key models and simulations: 3D models of the cable-stay bridge structure, 4D BIM models to

PROJECT SUMMARY

ORGANIZATION
ABM Knowledgeware Ltd.

SOLUTION
Bridges and Tunnels

LOCATION
Mumbai, India

PROJECT OBJECTIVES
- To create an integrated digital project management system for the construction of the Versova-Bandra Sea Link Bridge.
- To optimize collaboration and project delivery for all stakeholders of the MSRDC.

PROJECT PLAYBOOK
AssetWise®, OpenBridge®, OpenRoads™, ProjectWise®, SYNCHRO™

FAST FACTS

- The new bridge between Versova and the Bandra-Worli Sea Link will connect Mumbai, saving commuters valuable time and reducing carbon emissions.
- With support from Bentley and their digital integrator arm Cohesive, ABM Knowledgeware used 3D models, as well as 4D and 5D simulations, in one connected data environment.
- The transparency provided by Bentley software enabled clear communication within the project team and with external stakeholders.

ROI

- Commuters will save 45 minutes each trip upon completion in 2028.

"Our digital project management system helps effectively monitor the project's progress in terms of schedule, costs, and quality of the work through various dashboards now available with deployment of multiple IT systems. We look forward to redeploying this technology stack in our future projects."

– Shri Sunil Bhutada, Chief Engineer and Project Director of the VBSL Project, Maharashtra State Road Development Corporation

facilitate construction, and 5D simulations of the entire project that integrated material costs and construction schedules. These models have been integrated into a single platform to provide real-time insight as the project proceeds.

Crucially, Bentley's technology combines these models in a common data environment, set up to drive collaboration between all key stakeholders across functions and disciplines. It has allowed the entire team to monitor time, cost, quality and risk across the entire lifecycle of the project. Cohesive and Bentley also worked with ABM Knowledgeware, MSRDC, and its partners to train users to get the most out of this technology. This training involved larger initiatives like change management workshops, as well as more detailed policies that included new naming conventions and data management policies.

The digital project management system has enabled ABM Knowledgeware to preempt compliance issues by boosting visibility and enforcing standards in their common data environment. It has also simplified communication between various stakeholders, be they fellow engineers or members of the construction ecosystem community. And most importantly, it has simplified collaborative workflows across the board. MSRDC now benefits from the seamless transfer of information among all their stakeholders.

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CLEARER COMMUNICATION FOR FASTER, MORE SUSTAINABLE CONSTRUCTION

The Versova-Bandra Sea Link is scheduled to be completed in 2028, but ABM Knowledgeware, the MSRDC, and other partners are already seeing substantial benefits after employing Bentley's technology. Their teams have seen major boosts in productivity due to reduced downtime, simpler collaboration, and overall improvement in the quality of their deliverables.

Their new digital project management platform allows engineers, construction employees, and other stakeholders to consult multiple 3D models and BIM simulations in a single connected data environment. This connectivity has allowed the team to more accurately predict delays in construction by integrating schedules and workflows from across the project. Working from a single source of truth, staff and cross-functional experts are working together quickly and intuitively.

The new platform has particularly improved the capacity to achieve sustainability goals. All stakeholders are now able to map and report the carbon equivalent of their operations, which is captured in the digital BIM ecosystem and converted into a real-time carbon calculation. The platform has also enabled engineers and contractors to better plan for monsoon season and deploy safer, cleaner silt fencing practices near bodies of water.

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