

Wisconsin Leads by Example

By **Bill Napier**, Architect and Professional Engineer, Wisconsin Department of Administration Project Manager

LIKE ALL STATES, WISCONSIN government is faced with challenges of limited resources, aging workforce and increasing demands for environmentally responsive facilities.

Unlike all States, the Wisconsin Department of Administration has engaged in systematic implementation of Building Information Model (BIM) software tools and development of new processes that enable us to meet our capital development challenges. The lessons we have learned about large-scale BIM deployment can lead other public and private entities to successful resolution of the significant challenges facing all of us in the building industry.

As in the private sector, no major tool set and business process change can be successful without support from the highest level of the organization.

In fact, our journey to BIM was launched on April 11, 2006 when Governor Jim Doyle signed Executive Order 145 requiring all state

buildings to conform to high environmental and energy efficiency standards. When signing the act, Governor Doyle stated, "...I want the state to lead by example. This Executive Order will make sure that our state buildings are a model for the rest of the state in energy conservation, and save us millions in the process."

The order requires the Department of Administration to set goals, establish programs, create guidelines and use integrated processes to conserve energy and improve sustainability on capital projects.

It quickly became clear that BIM was necessary to meet requirements of the Executive Order on our \$1.2 billion of annual construction projects involving more than 300 construction firms and more than 200 design firms serving 16 state agencies and the 13-campus University of Wisconsin System. The state-wide building portfolio includes more than 6,200 facilities with a replacement cost estimated at 9.5 billion dollars.

To meet the goals of the Executive Order for such a large enterprise, we began moving from a project-centric management approach to a portfolio management approach.

Combining the demands of portfolio management and energy conservation would greatly improve Total Cost of Occupancy and Ownership but require guidance from the construction industry, state agencies, the University of Wisconsin System and others.

It became clear that BIM could help us achieve the high performance standards and energy conservation the Governor required for State facilities and operations.

To take advantage of BIM, process changes were needed. On March 13, 2008, David Helbach, the Division Administrator and Secretary to the Building Commission said, "The State Building Commission has directed DSF (Division of State Facilities) to work with interested parties to clarify the conditions under which state interests are best served by employing alternative delivery methods

and to recommend statutory language changes." Recommendations are scheduled to be presented in November to the Building Commission.

BIM IMPLEMENTATION

The Department of Administration Division of State Facilities is working with state agencies, the university system, and private companies in the building industry to develop guidelines and standards for formal implementation of BIM rollout strategies officially beginning in July 2009.

BIM seminars have been held and are being scheduled in conjunction with the University of Wisconsin, 13 pilot projects are in progress for state agencies, surveys of public and private entities are being conducted, business cases are being developed, education plans are in place with professional organizations, such as the buildingSMART alliance™ (editors note: the author is the current Education Contact of the Alliance), the DOA took a leading role in the AIA BIM Award winning BIMstorm LAX in January 2008 and other initiatives are in place.

The Department has provided education and discussion at the past two Annual DSF Consultants Conferences sponsored by the American Council of Engineering Companies. The presentation topics have included: "Looking to the Future: Building Information Modeling"; "Building Information Modeling: Present & Future - Discover the Power of BIM in Design Coordination"; "Design Solutions - Integrating MEP Building Information Models" and "Legal & Operational Aspects of BIM."

PILOT PROJECTS

The 13 BIM pilot projects have a combined construction value of more than \$300 million and are being delivered using traditional design-bid-construct methods. The initial uses of BIM focused on architectural and structural design. Some MEP consultants had the capability to utilize BIM software and processes.

A recent survey of pilot project participants found that the initial benefits included



Roof Stacks Option 1.



Roof Stacks Option 2.

improved communication and understanding of the project due to the visualization capability of the technology. The design teams report that this improves their understanding of the project complexities and allows the client agency to react early in identifying adjustments to program space needs. The ability to visualize and apply automated clash detection in the design process has improved coordination between disciplines. Continued monitoring of these projects as they move into construction will allow all state client agencies and building industry professionals to learn from our activities. We expect the projects will have reduced user agency generated change orders and less coordination-related errors and omissions.

This year, DSF will provide an update on developing guidelines and standards for using BIM on state projects.

LEADERSHIP

It is not a matter of whether or not the building industry in Wisconsin will retool with BIM, it is only a matter of how. How to implement this technology to leverage the improvements BIM allows is the challenge that is being met by our leadership and staff. The DSF is developing business cases that benefit both the public and private interests to accelerate the adoption of BIM for capital projects. Under the leadership of David Helbach, Wisconsin is showing a holistic approach as inspired and encouraged by the highest level in the State Capital of Madison, Wisconsin.

The July 13, 2008 National Governors Association Issue Brief included a piece titled, "Greening State Government: "Lead by Example" Initiatives." It included the following text, "The [Wisconsin] Department of Administration is currently working with business partners and other state agencies to develop a set of guidelines and standards for architects, engineers, and contractors to follow in carrying out design and construction Building Information Model (BIM) deliverables on certain projects. BIM is a digital representation of all aspects of a facility and can assist state agencies in assessing energy use within a particular facility."

WHAT DOA IS DOING

The Wisconsin DOA has a comprehensive approach to state-wide building industry adoption of BIM that can be clearly traced and emulated by other States and large building owners, designers and developers. Key to the initial success and buy-in of all parties is the connection

of the "green building" executive order to an administrative action plan focused on Building Information Models.

As a members of FIATECH, the Wisconsin Department of Administration and Department of Commerce (responsible for regulatory administration of the adopted state wide building code) have joined together to accelerate implementation of BIM for both design and regulatory compliance using model checking being developed by the ICC smartCODE initiative. As the rules-based model checking software is refined, the state will have higher levels of certainty of outcomes for project goals and will encourage greater levels of BIM adoption by the entire State building industry.

Key to statewide implementation of BIM is support of open standards for BIM software interoperability as championed by the buildingSMART alliance™. Open standards will assure that project data can be used for many diverse applications including energy modeling, sustainability analysis, cost tracking and schedule management. The principle objective of supporting open standards is to maintain one set of data for multiple uses without re-entry of existing data into new applications. Open standards are key to successful BIM implementation and the Wisconsin DOA is proud to join other government agencies, such as the General Services Administration and the United States Coast Guard in supporting the Alliances efforts to maintain and develop this interoperable data exchange format.

In February, the Department participated in the BIMstorm LAX demonstration planning process organized by Onuma, Inc. The state provided program data and assembled a planning team that included Connolly Architects of Milwaukee, and Paul Adams, AIA, Denver Colorado. The value of open standards for digital exchange, and experiencing new ways of working with the applications was invaluable to those that participated and observed.

The most significant benefit of the education sessions and one-day BIM design exercise was understanding that the key issue is not the use of new software tools but the new way people work together in real time because of those tools. Throughout the day of the BIMstorm, it became apparent that the main transformation BIM enables is the way we work and interact with each other. The event showed that the project owner and A/E relationship will be more transparent and collaborative in sharing the

development of solutions and decision making for effective results.

The Department continues to meet with state agencies and university facilities to determine short term objectives and long term goals of BIM implementation. We are now working on the CAD / BIM / GIS standards for electronic plan distribution and for record documents for archival integrity.

With governmental leadership, early adapter architectural leadership, education support and business process leadership clearly pointing the way to success, Wisconsin's BIM initiatives clearly demonstrate the state motto – "FORWARD." The State is clearly pointing its building industry to an almost unprecedented opportunity to address environmental concerns and economic development at the same time.

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Roof Stacks Option 1 at Grade.



Roof Stacks Option 2 at Grade.