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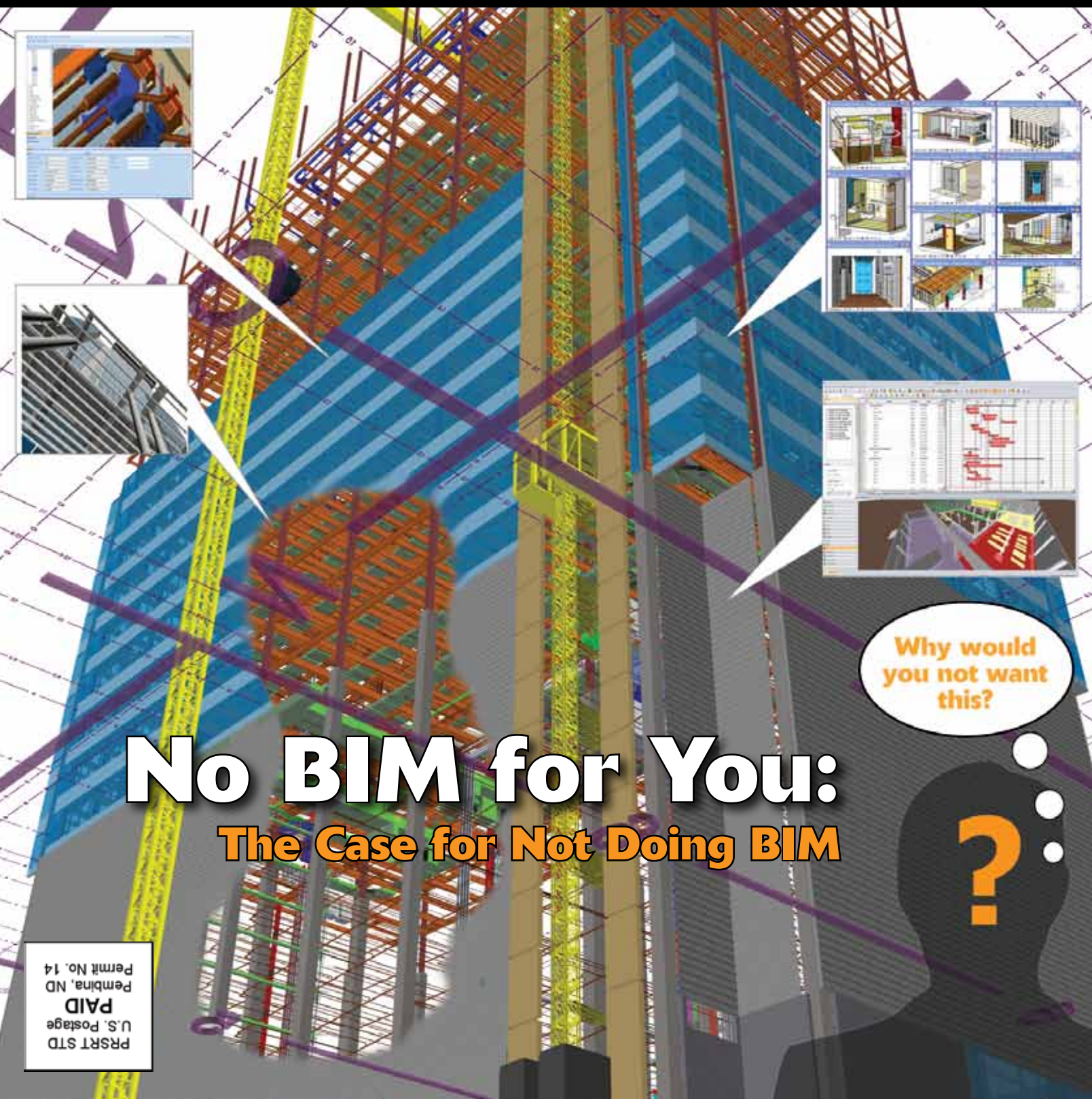


No BIM for You:

The Case for Not Doing BIM

BIM as a Risk Management Tool: Creating As-built Models for Municipal Management

By Jay McBride, Robert Steffen and Doug Kinard

DATA MANAGEMENT IS A RECURRING PROBLEM FOR facility maintenance divisions of municipalities, both large and small. Regardless of the size of the municipality, the amount of information available is overwhelming when viewed by the relatively small number of people employed to manage it. The evolution of computers and information technology has made it easier for cities of various sizes to collect large amounts of data from more sources and this compounds the problem. Every municipal facility is unique, with different operational and maintenance costs, intended use and level of security. The problems associated with data management are exacerbated by the sheer number and variety of these facilities. Cities now have the capacity to integrate sustainability concepts into facilities and infuse them with increased longevity. The ability to lower energy consumption requires an efficient model to help manage the large volume of collected data.

Current building information modeling (BIM) research by W.E. East focuses on information exchange in order to achieve full energy management control within a single computer model.[1] The conclusion of this research could help municipalities reach lofty energy goals. As an example, the city of Asheville, North Carolina, has established an Office of Sustainability to facilitate its effort to reduce energy consumption and provide better overall operations of its capital facilities. According to the *Asheville Sustainability Annual Report 2009*: "In April 2007, City Council passed a resolution committing to reduce the municipal carbon footprint 80 percent by the year 2050 and requiring a strategic plan to lead this effort." It is currently one of the most aggressive initiatives related to sustainability by any city in the United States and they have aptly named this effort "How Low Can AVL Go?" (FIGURE 1 AND FIGURE 2).

A reduction in energy consumption provides the largest impact for sustainability and efficiency. The creation of a comprehensive operations and maintenance plan within a BIM program could assist this effort.

Asheville Convention & Visitors Bureau.

The Asheville skyline.

Municipalities have unique opportunities to increase efficiency by using BIM to organize multiple layers of information within a single model. There is nothing that prohibits the development of as-built models to include multiple buildings, systems and roads. Streamlining the operations of capital facility data management through a central BIM could provide a municipality with a dynamic tool for sustainability.

BENEFITS

One benefit of utilizing a central information model in municipal buildings management is efficiency. Operations and maintenance manuals and other contract documents could be searched electronically, eliminating manual searches that are performed in a room full of printed literature. The inclusion of a utilities module could provide detailed information on utility consumption, distribution, use, metering, cost and allocation to users.

A utility module could also include modeling capabilities and links to control systems and estimates on electrical demand loads (Sapp, 2010). Further work is necessary in order to store construction documents and data in a standard format as well as query this information efficiently (Goedert and Meadati 2008). However, the adoption of the Construction Operations Building information exchange (COBie) would help eliminate waste associated with creating, reproducing, processing and archiving paper documents (East, 2009).

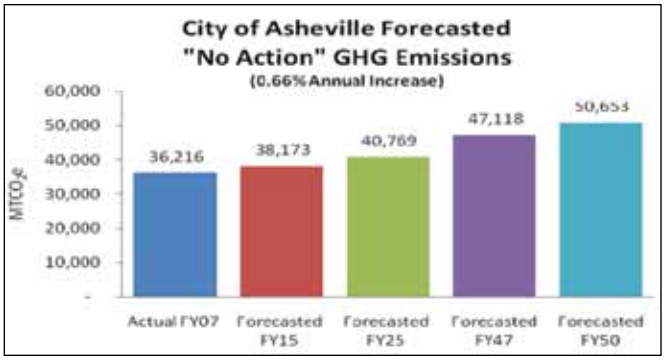
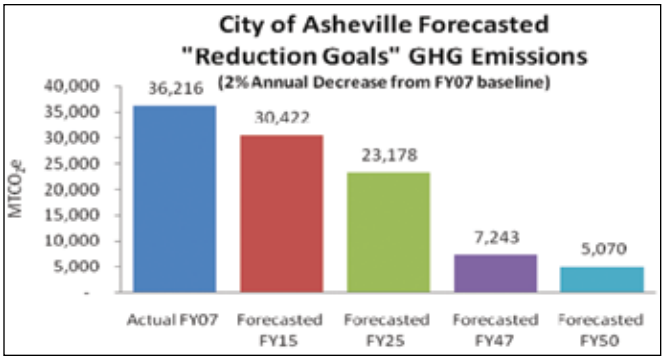


Figure 1. "No action" GHG emissions



City of Asheville, North Carolina.

Figure 2. "Reduction goals" GHG emissions

Industry experts that are tracking and promoting the use of BIM have projected that there will be new maintenance and monitoring features in the near future and these features will be applicable to single or multi-building management: "The vision we have is with an interoperable BIM that, in minutes rather than days or weeks, allows you to take your current architectural design from your favorite platform, import it into your favorite energy program and do your analysis. Your consultant, within a few hours of work rather than a few weeks, now can work as a team on energy alternatives and optimization," (Selkowitz, 2010).

LIABILITIES

When it comes to implementing BIM, one major obstacle for municipalities is the financial burden associated with the initial set-up and maintenance of the model. This includes direct costs such as buying software and training personnel on that software.

In an environment where the utilities are tracked for multiple municipal buildings, the issue of intellectual property rights of the individual models and resource sharing/authorizations will have to be addressed. For example, who will own the model, who is allowed to access and modify the model and to what extent is the owner liable? These issues will need to be resolved. The advent of BIM provides construction managers with a new project management tool but raises concerns about liability and design ownership, particularly on public works projects.

The Department of Homeland Security (DHS) has established guidelines that restrict access to specific information about certain facilities, which would be contained in a comprehensive model. Examples of such facilities are police stations, jail houses, city and county courthouses, and municipal water reservoirs. Identifying areas that are potential security risks must be made and steps taken to ensure that certain information be kept secure.

PROJECTIONS

Governmental departments are driving the application of BIM for sustainability. The U.S. General Service Administration (GSA) has mandated that all GSA facilities must be net-zero carbon energy buildings by 2030. The administration released a *GSA BIM Guide for Energy Performance* in 2009 and is currently creating a BIM guide for operations and maintenance with a strong focus on sustainability (Matta 2010). Similarly, the Department of Defense (DoD) is relying on BIM software to reduce energy footprints on all future DoD projects (East, 2009).

Sustainability goals integrated within a BIM environment may soon be realized through green building construction. Green building experts are searching for ways in which BIM could help create sustainable facilities in the future. Research shows that BIM has a limited impact on green building processes today but could be a valuable tool in the coming years (*SmartMarket Report*, 2009). Many of the current sustainability efforts are inherent in U.S Green Building Council (USGBC) initiatives such as the *Leadership in Energy and Environmental Design* (LEED) certification program.

The development of BIM is changing the way that structures are designed, built and maintained more than any other development since Filippo Brunelleschi's single-point perspective in the 15th Century, which paved the way for blueprints.[2] A comprehensive BIM has multiple layers that contain various types of data. Limits are being removed in an effort to import all relevant data concerning the design, construction and maintenance of facilities. Information gathered for use by managers could be used to identify areas that require sustainability improvements for either single or multiple buildings within a municipality. Inefficiencies in the data management processes used by members of municipalities have long been recognized. As BIM has shown returns on investments with the design and pre-construction phases on multiple projects, it could also provide greater returns for existing facilities and improve the sustainability of municipal facilities. ■

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FOOTNOTES

1. East, W.E. (2009). "Performance Specifications for Building Information Exchange", *Journal of Building Information Modeling*. Fall 2009, pg 18-20.).
2. Filippo Brunelleschi (1377 – April 15, 1446) was one of the foremost architects and engineers of the Italian Renaissance.

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