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## BLUEPRINTS TO BIM: WHY BUILDING OWNERS SHOULD RETHINK THE WAY THEY EXECUTE CAPITAL PROJECTS

**W**ith ever-tightening budgets, aging infrastructure, and complex retrofit needs, building owners are facing increasing pressure to make their capital improvement dollars go further. Yet many owners still rely on decades-old tools and processes—chief among them, traditional 2D blueprints.

In today's world, there's a better way to navigate construction projects, especially those that take place within existing buildings. It's called Building Information Modeling (BIM), and it has been transforming the way the built environment is designed, coordinated, and constructed. Unfortunately, while BIM has become commonplace in many other construction sectors, it remains underutilized in existing multifamily buildings undertaking retrofit projects, particularly those focused on building infrastructure with limited architectural scope.

### Retrofit Projects Are Complex— Modern Tools Help Simplify Them

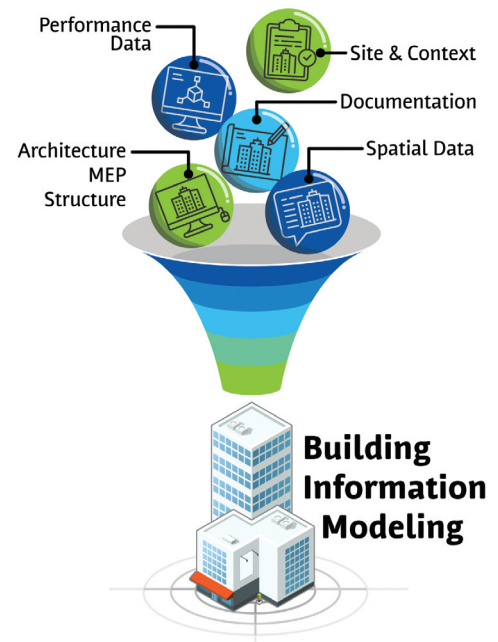
Retrofitting an existing building is rarely simple. This is particularly the case with decades-old vintage properties where the original documentation is often incomplete or outdated, utilities are packed tightly into constrained spaces, and unforeseen conditions

are the norm rather than the exception. These challenges can lead to cost overruns, delays, and frustrating surprises once construction begins. BIM can't magically solve these challenges, but it is a tool that can help to mitigate these issues prior to construction.

### What Is BIM?

To understand BIM, it helps first to recognize the limitations of traditional 2D drawings. Blueprints are flat representations of complex, three-dimensional systems. While they provide valuable information and have been the industry norm for over 100 years, they leave much to interpretation. Any assumptions made in the bidding process can lead to change orders, miscommunication, and costly rework during construction.

BIM, on the other hand, is a comprehensive digital model of the building or project area that integrates not only a third dimension of geometry and space, but can also include detailed information about materials, phasing, and even the relationships among systems like electrical, plumbing, HVAC, and structural components. Imagine it as a digital dollhouse where everything can be examined, rotated, and coordinated -- all before construction even begins.



This digital model allows engineers, architects, and contractors to collaborate more effectively and develop smarter solutions earlier in the design process.

### Common Condo Construction Headaches— Addressed Before They Start

By directly addressing common challenges faced by building owners undertaking retrofit work, BIM delivers the following benefits:

**Fewer Surprises:** In older buildings, ductwork, piping, and conduit are often routed through tight spaces and represented by a single line in a 2D drawing. With these traditional drawings, actual existing overlaps aren't caught until construction—requiring last-

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**Building**



**Information**



**Modeling**

To break down the acronym in simple terms:

**BUILDING**

The design software is focused on the built environment and the systems that make a building function.

**INFORMATION**

Integrated data embedded within the model (materials, equipment sizes, performance specs, etc.)

**MODELING**

A reasonably accurate 3D digital representation of the building or project area.

minute changes and compromises. With features like clash detection and 3D walk-throughs, BIM enables designers to verify that systems work together in harmony during the design phase. This means fewer change orders and unexpected costs during construction—helping keep your project on time and within budget

**Improved Visualization:** Understanding spatial layouts from 2D drawings can be difficult, especially in tight mechanical rooms or utility chases. BIM gives all stakeholders—from building owners to contractors—a clearer understanding of how systems will fit and function in the real world. Additionally, contractors can use MEP BIM models to plan their installations more effectively, leading to higher-quality builds and fewer issues down the line. This can result in a greater value for your investment.

**Team Integration:** BIM enhances communication among all parties involved. Building owners can see a more representative illustration of the work to be done, and contractors can better understand design intent to provide bids with greater confidence. For project teams, BIM acts as a centralized platform for all disciplines—architecture, structure, and MEP. The more effort placed into the model upfront, the smoother the rest of the project proceeds.

**3D Scanning for Existing Conditions:** When appropriate, project teams can use advanced scanning tools to digitally document a building’s current condition. This enables the creation of more accurate models that form the foundation of the design. While 3D scanning may not always be practical due to cost and project scope, tools like 360-degree cameras offer a more accessible way to improve design quality and accuracy.

**Why Isn't BIM the Norm across all Projects?**

Despite its clear advantages, BIM has not yet become standard practice in the retrofit market, in particular, multifamily infrastructure projects. One reason is that the full benefits of BIM are more immediately visible in new construction or major redevelopment projects where occupied spaces are being visually transformed and aesthetics play a larger role. Retrofit projects often are viewed as too small or too constrained to justify the perceived extra effort.

However, engineers and designers who have experience in various project types and with BIM have experienced the value it brings and many, including Elara Engineering, have now standardized BIM procedures and utilize the technology on nearly all project types.

With the increasing complexity of building systems, tighter construction schedules, and rising construction costs, more building owners are starting to recognize the benefit BIM provides—even for small and mid-scale retrofits and infrastructure projects. BIM attempts to move problem-solving from the construction site to the design office, where issues are cheaper and faster to resolve.

WITH THE INCREASING COMPLEXITY OF BUILDING SYSTEMS, TIGHTER CONSTRUCTION SCHEDULES, AND RISING CONSTRUCTION COSTS, MORE BUILDING OWNERS ARE STARTING TO RECOGNIZE THE BENEFIT BIM PROVIDES EVEN FOR SMALL AND MID-SCALE RETROFITS AND INFRASTRUCTURE PROJECTS.

**The Bottom Line: Better Design Tools Can Bring Better Results**

Practical, well-coordinated designs are the foundation of a successful project. BIM enhances that philosophy, giving the designer tools to deliver:

- Fewer surprises during construction
- Better utilization of tight spaces
- Improved communication with contractors and stakeholders
- Higher quality results with less waste

Building owners are encouraged to ask more from their design partners. What tools and processes are being used? Is BIM part of the design conversation?

Investing more effort during the design phase may feel like an added upfront cost—but designers established and experienced in using BIM typically do not increase their fees for BIM projects knowing that its use often leads to reduced overall expenses, enhanced project delivery, a more collaborative project team, and further owner satisfaction.

Thoughtful, modern design with BIM adds real value to your building—and to your bottom line. ■■

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