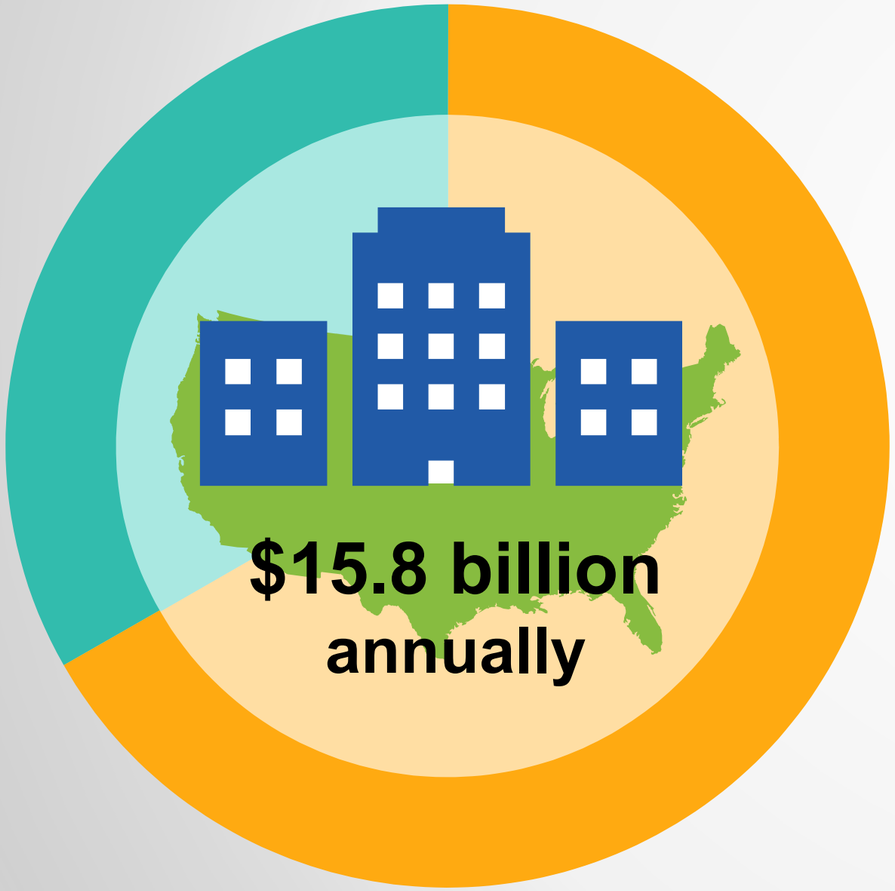
The Value of BIM for Owners: Save Time and Money During the Building Lifecycle

AUTODESK.

The cost to owners

Poor use of data coupled with highly fragmented teams cost the US capital facilities industry $15.8 billion annually[1]



Owner's burden is about 2/3 of those costs during ongoing operations.

[1] Michael P. Gallaher, Alan C. O'Connor, John L. Dettbarn, Jr., and Linda T. Gilday, *"Cost Analysis of Inadequate Interoperability in the U.S. Capital Facilities Industry"*, August 2004

AUTODESK.

Problems owners face

Over **60%** of major capital programs fail to meet cost and schedule targets[1]

30% of construction cost is rework[2]

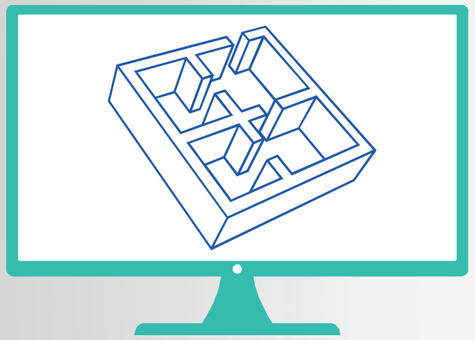
55% of maintenance remains reactive[3]

[1] Independent Project Analysis Institute
[2] *Rethinking Construction,* John Egan
3 US Department of Energy, Operations and Maintenance Best Practices Guide, August 2010.

AUTODESK.

Building Information Modeling (BIM)

A foundational, intelligent model-based process for business and industry transformation.



Use 3D models to capture, explore and maintain consistent and coordinated planning, design, construction and operational data

Provide greater project insight for cost, schedule and constructability

Use and share the same consistent data whether at your desk or in the field

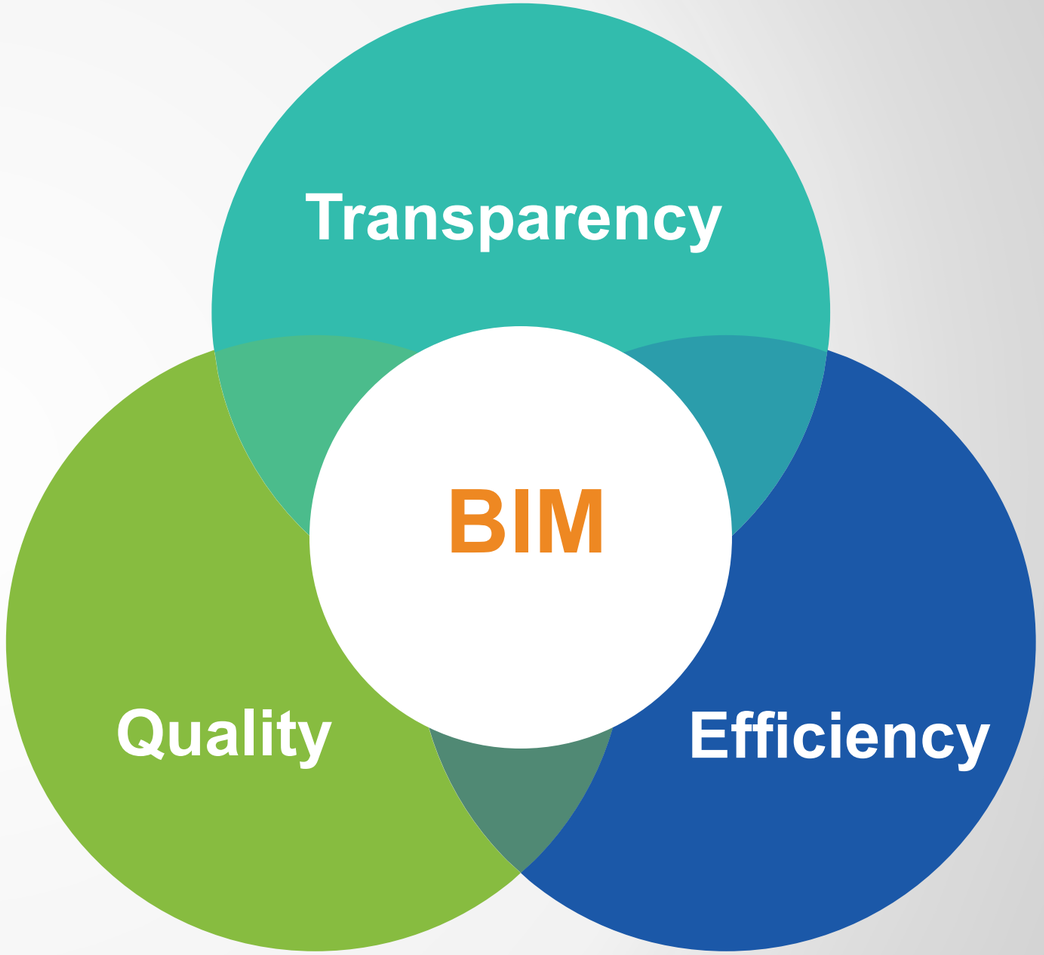
Enable prompt response to change with processes that are smarter and faster

AUTODESK.

BIM empowers owners

Using BIM, owners can:

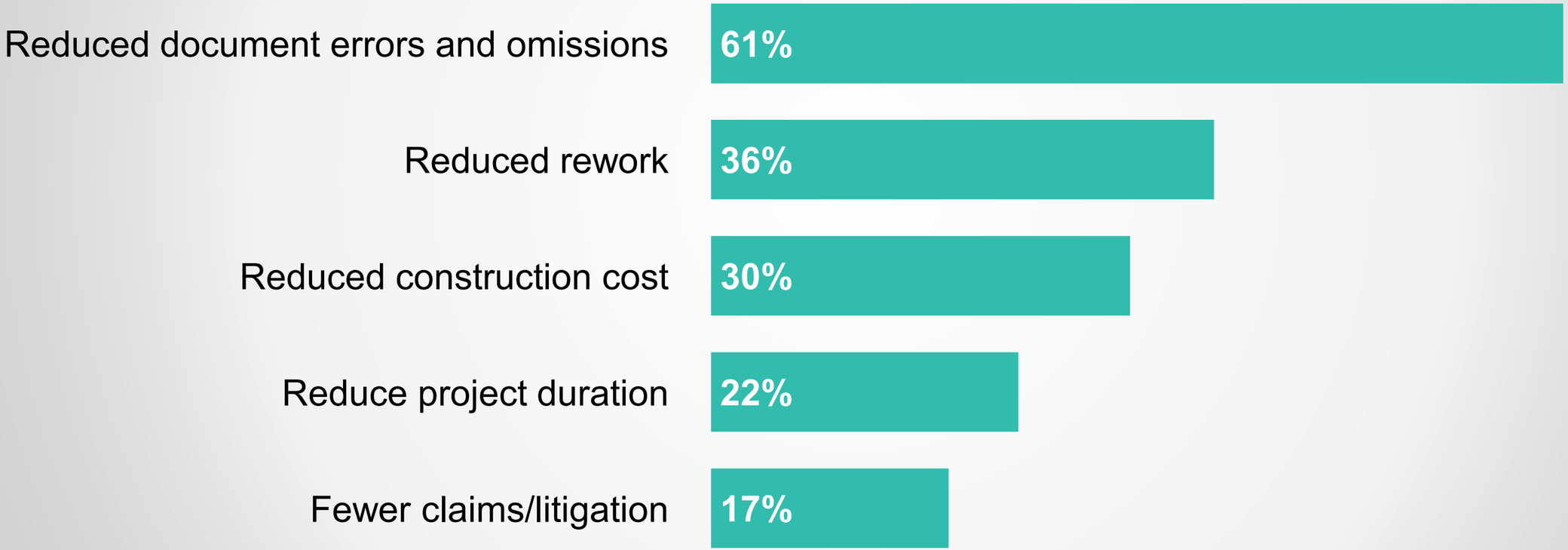
- Improve building quality
- Significantly reduce building lifecycle costs
- Better understand design projects from beginning to end
- Optimize operational efficiencies
- Increase occupancy and use rates



AUTODESK.

Top BIM benefits for owners

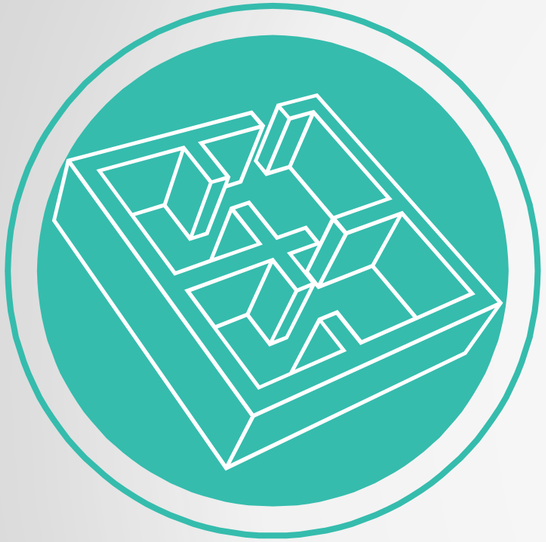
Top internal business benefits of using BIM for construction projects for owners.



Source: McGraw-Hill Construction, 2012

AUTODESK.

How BIM saves owners' time and money throughout the building lifecycle



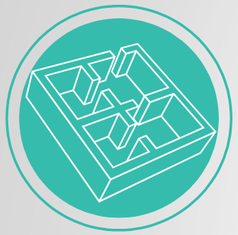
Design

Construction

Management

AUTODESK.

BIM saves time and money in the design phase

Area	Description	Example
Conceptual design 	Quickly iterate on design elements including building form, sustainability, client requests, municipal regulations, budget and more. Conduct analyses and simulation.	The Beck Group created 100 visualizations for a church in Seoul and adjusted the shape of the building to appear curved, but with flat glass, saving over $1 million on glazing and mullions, and 1,000 hours of design time.
Sustainable building design 	Complete energy analysis early in the design stage to reduce ongoing energy consumption.	Using BIM to evaluate design scenarios for energy savings, NASA's 50,000' building in Silicon Valley yielded features such as a steel-frame exoskeleton, geothermal wells, natural ventilation, wastewater treatment and a photovoltaic roof that will provide 30% of the building's power.
Design Documentation 	Create a building model and complete set of design documents in an integrated database, where everything is interconnected and there is real-time self-coordination of information.	

BIM saves time and money in the construction phase

Area	Description	Example
General construction 	▪ Link project planning to construction planning and simulation, as well as visualization during construction and digital fabrication ▪ Enhance project communication and collaboration among teams ▪ Create more accurate cost estimates ▪ Deliver more projects on time and within budget	Contractor Robins and Morton used BIM to design and construct an Augusta, Maine hospital. Due to greater collaboration, the project was completed ten months ahead of schedule and returned approximately $20 million in value-added savings.
Pre-fabrication, modular construction 	▪ Extract information from BIM to pre-fabricate building components to improve project schedule, reduce cost, improve site safety and produce greener construction practices by reducing material waste	J.C. Cannistraro used BIM and pre-fabrication to upgrade the central utility plant for the University of Massachusetts Boston campus helping to minimize installation time of a new HVAC system and hangers.

BIM saves time and money in the management phase

Area	Description	Examples
Lifecycle costs 	▪ Reuse building models and data to better manage facility operations ▪ Analyze data-rich models to optimize resources and reduce waste and lower lifetime maintenance and operation costs ▪ Use intelligent 3D models to help manage space and perform spatial validation for tenant chargebacks	▪ Shanghai Tower Construction & Development Co. Ltd. used BIM not only to design and build, but also to inform operations of their super high-rise tower. STC&D plans to use BIM for emergency and property management going forward. ▪ The Government Services Administration (GSA) is creating a database of its 3D models to inform O&M and future projects. Additional software leveraging the 3D models will use its data for security, updates, analysis and reporting.

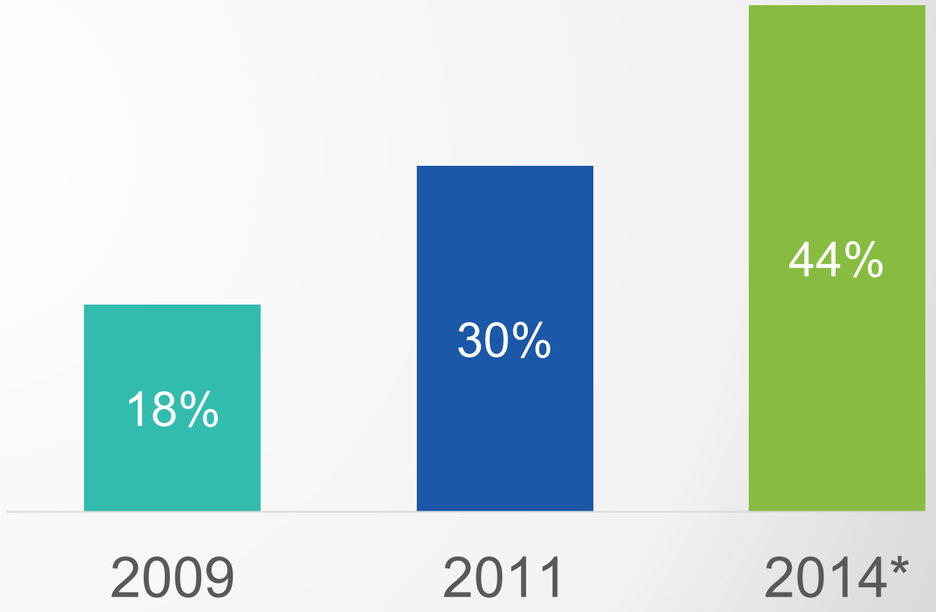
[*We plan to*] “extend the value of BIM to help our facility management staff plan efficiently and manage the building scientifically.”

—Jianping Gu, Director and General Manager of STC&D

Adoption is increasing through mandates, smart building initiatives, and owner edicts—creating a BIM tidal wave

- 44% of owners predict they will be at very high level of BIM implementation by 2014
- BIM usage is increasing across the board

Percentage of owners using BIM on more than 60% of their projects[1]



[1] Source: Smart Market Report by McGraw Hill Construction, 2012
*Projected

Reference Notes:
The McGraw Hill Smart Market Report—The Business Value of BIM is available on autodesk.com/bim

AUTODESK.

Customer ROI on BIM

Australia-wide adoption of BIM/VDC across the supply chain could enhance industry productivity by up to 9 percent … ROI for BIM implementation has been reported as high as 500 percent.

U.S.-based Holder Construction Group calculated that based on direct collision detection savings, their return on BIM has been three to five times direct BIM cost.

On a U.S. GSA federal building renovation in Portland, Oregon, the integrated project delivery team estimated that the use of BIM for coordination helped generate an approximately 300 percent ROI.

Citations in order from the above bullets:

Judy A. Kraatz ,Adriana X. Sanchez, Keith D. Hampson, "*Digital Modeling, Integrated Project Delivery and Industry Transformation: An Australian Case Study*", 2014.
Michael LeFevre, "*No BIM for You: The Case for Not Doing BIM*", 2011.
American Institute Of Architects (AIA) 2012 TAP/BIM Awards, "*Edith Green Wendell Wyatt (EGWW) Federal Building Modification*", 2012.

AUTODESK.

The future of the building lifecycle

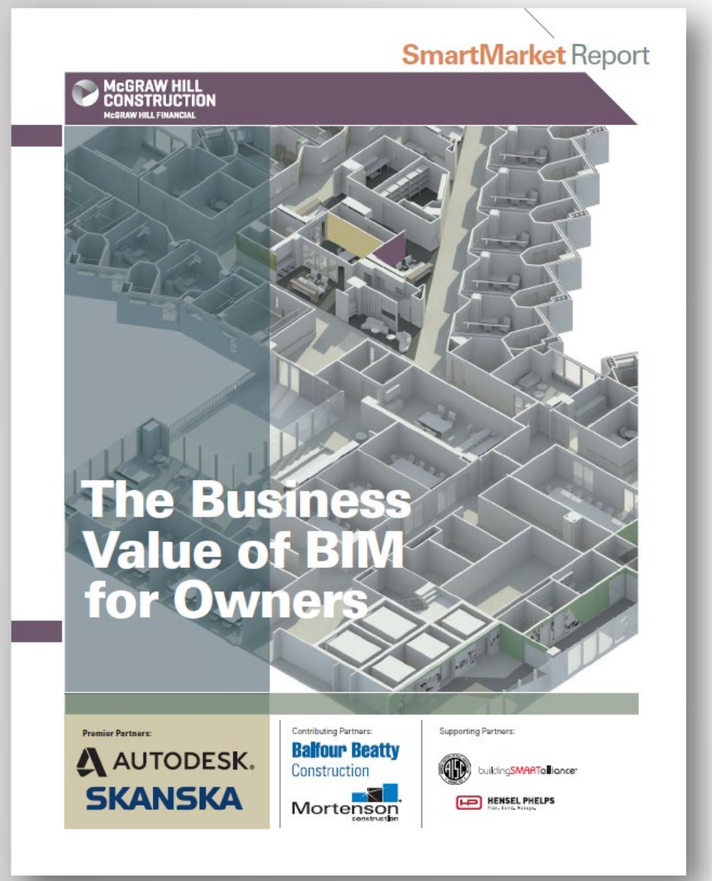
The relationship between digital systems and connected physical things will only increase and strengthen

BIM empowers owners to capitalize on the Era of Connection

- Compare design and construction alternatives in context
- Leverage the Internet of Things for ongoing operations
- Use BIM-enabled efficiencies and capabilities as a new baseline for owners

AUTODESK.

Learn more



[Download](#) the McGraw-Hill Construction Smart Report.

[Download](#) the Economist Intelligence Unit report.

AUTODESK.