BIM & GIS Integration: Panel Dialogue on Innovating Projects into Operation

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GIS day

www.gisday.com

About the speakers

Anthony Renteria, Esri | LinkedIn

Anthony is Esri's Product Manager for AEC Workflow integration focused in design and construction project delivery. He is currently working with customers interested in BIM & GIS integrations that enhance their workflows, provide better engagement opportunities, and transform how their projects are delivered into clients for operations. Prior to joining Esri, Anthony worked in industry for over (13) years where he was responsible for assisting AEC teams with project technology planning while integrating innovative solutions to complete tasks faster and with the utmost quality. While Anthony began working in the general contracting realm of the industry, he has worked extensively with designers and owners to improve standards and develop BIM implementations that encompass the full project lifecycle. Anthony is CM-BIM certified (AGC of America) and holds a BS in Mechanical Engineering from the University of Southern California.

Stephen Brockwell, Esri | [LinkedIn](#)

Stephen started as an ArcInfo developer in 1987. Since then, he has held leadership positions in software engineering management, product management, and business development at Geovision, Autodesk, Brockwell IT Consulting, and, most recently, Esri, who acquired Brockwell IT in 2019. At Esri, Stephen is working to define the future of GIS-BIM integration for horizontal and vertical infrastructure for developers, engineering firms, and owner/operators with a focus on data and application integration, and transformative workflows across the full-stack architecture—from mobile to desktop to cloud.

Adam Sjödin, Sweco | LinkedIn

Adam works as a city planner and digital strategist at Sweco's architects in Stockholm. Sweco, over the last year, explored what an integration of GIS and BIM data can have for practical applications in the early stages of the community building process. In the past, Adam has presented on how GIS and BIM together can be used in an easy way to visualize, coordinate and communicate projects in architecture and urban construction.

Alistair Fox, Jacobs | LinkedIn

Alistair is a Principal Geospatial Consultant at Jacobs' Perth office. He is a Global Technology Lead for Geospatial Integration in Jacobs Solutions and Technology. With the focus on Digital transformation of a traditional AEC firm the area of BIM and GIS Integration is at the heart of Innovation initiatives for Jacobs. Alistair is leading the charge in this area directing initiatives that look to bring the engineering / built environment more aligned and integrated with the natural an geographic environment. With the vendors now making great inroads with new tools and technology its our geospatial leaders who have the challenge of implementing these into new workflows and convincing traditional methods they need to change. Alistair is up to the challenge and keen to see a large AEC firm like Jacobs transform how it approaches the traditionally separate areas of BIM and GIS going forward.

Jeff Siegel, HNTB | [LinkedIn](#)

Jeff is Practice Director and Information Technology Project Manager specializing in the implementation of sophisticated information systems supporting transportation and smart government solutions. Jeff has been responsible for the creation of a digital innovation/technology services practice at HNTB and stewarding its consistent profitable growth over the last sixteen years. The successful growth and delivery of this business unit has led into the branding of the client-focused practice as HNTB's Technology Solutions Center as the firm's center of excellence for digital innovation and data management.

Nigel Stroud, Heathrow | [LinkedIn](#)

"Nigel has worked for 30 years in the construction industry, Implementing Digital Asset Information strategies and evangelising in efficient data workflows. His focus is always on a single source of data, providing decision making capabilities for a diverse customer base. As a practitioner, he has adopted a 'keep it real' approach enabling usable and sustainable solutions to be adopted. His manufacturing and assembly background have utilised his analytical skills to develop and implement time saving processes.

He was privileged to have worked for the duration of Heathrow's Terminal 5 and Terminal 2 programmes, setting up and on-going management of the Common Data Environment and digital deliverables. He is currently working in Heathrow's Digital programme, implementing a company wide digital asset information strategy."

Current State of BIM-GIS Integration
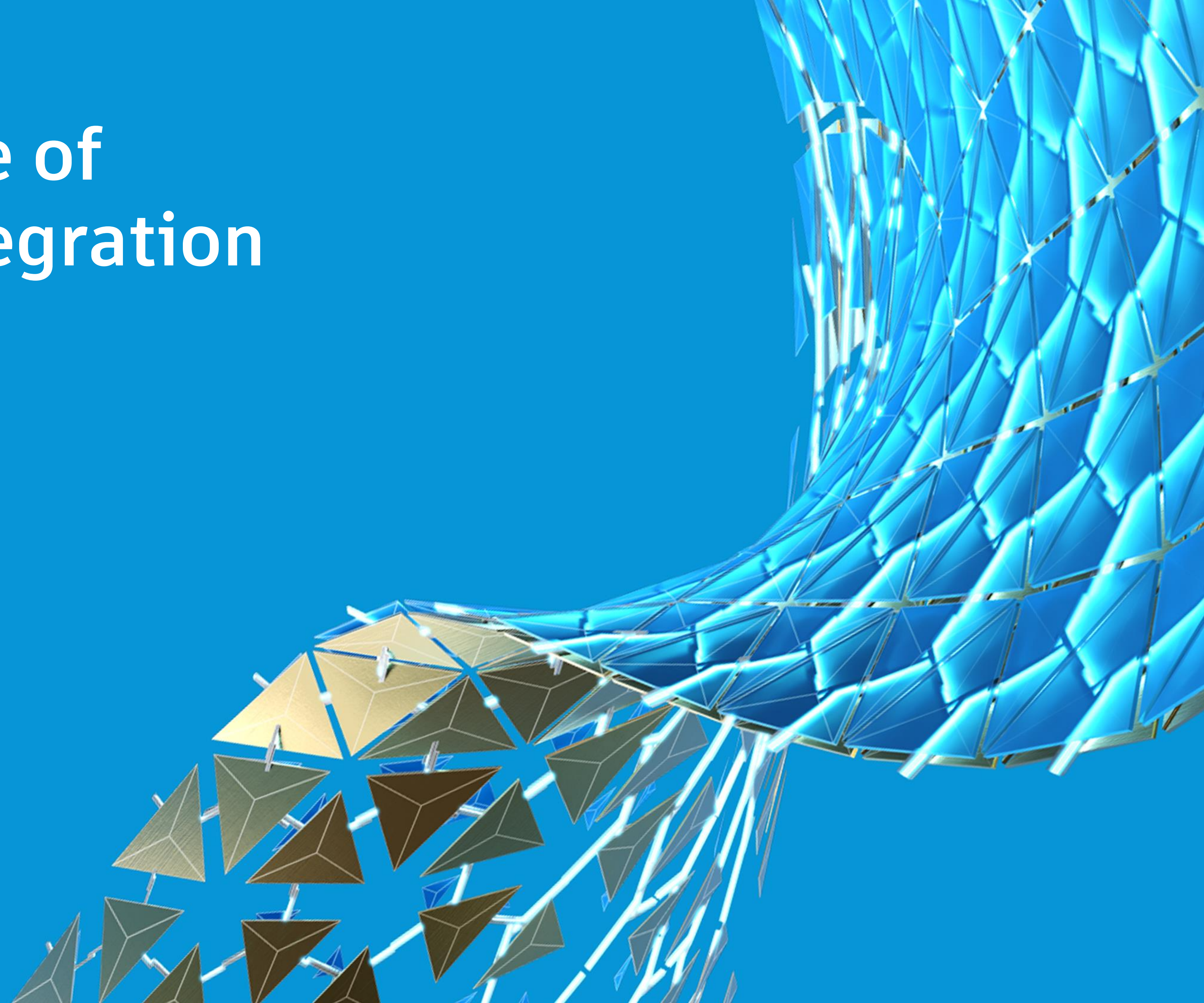
BIM-GIS Overview

BIM IS A PROCESS

BIM is focused on the process of information sharing for standardized models of assets. BIM covers design through decommissioning.

GIS IS A SYSTEM

"A geographic information system (GIS) is a framework for gathering, managing, and analyzing data, rooted in the science of geography"—Esri

BIM CAN BE STANDARDIZED

GIS MODELS TEND TO BE OPEN BUT DIVERSE

BIM HAS ALWAYS BEEN HORIZONTAL AND VERTICAL

BIM gained usage in Design and now the priority has been to model the complete 3D asset with correct information.

GIS HAS BEEN TRADITIONALLY HORIZONTAL

Vertical coordinate systems are critical for positioning real-world 3D assets on the ground with sufficient accuracy and precision for engineering purposes.

Distinguishing Between BIM and GIS

A Perceived Boundary Between GIS and BIM Lacks Clarity for Organizations.

ISO 19650:2019 defines **BIM** as the use of a shared **digital** representation of a **built asset** to facilitate **design**, **construction** and **operation** processes to **form** a reliable basis for decisions.

For linear assets, this has been a working definition for GIS in practice—however, the engineering details are typically overlooked in GIS (grading, profiles, alignments).

Chris Andrews, Group Product Manager at Esri, discusses the myths and realities of BIM-GIS integration here:

https://www.esri.com/arcgis-blog/products/arcgis-pro/3d-gis/5-myths-5-realities-bim-gis-integration/

How are you increasing the awareness of BIM-GIS Integration in your organization?

The Drivers for BIM-GIS Integration
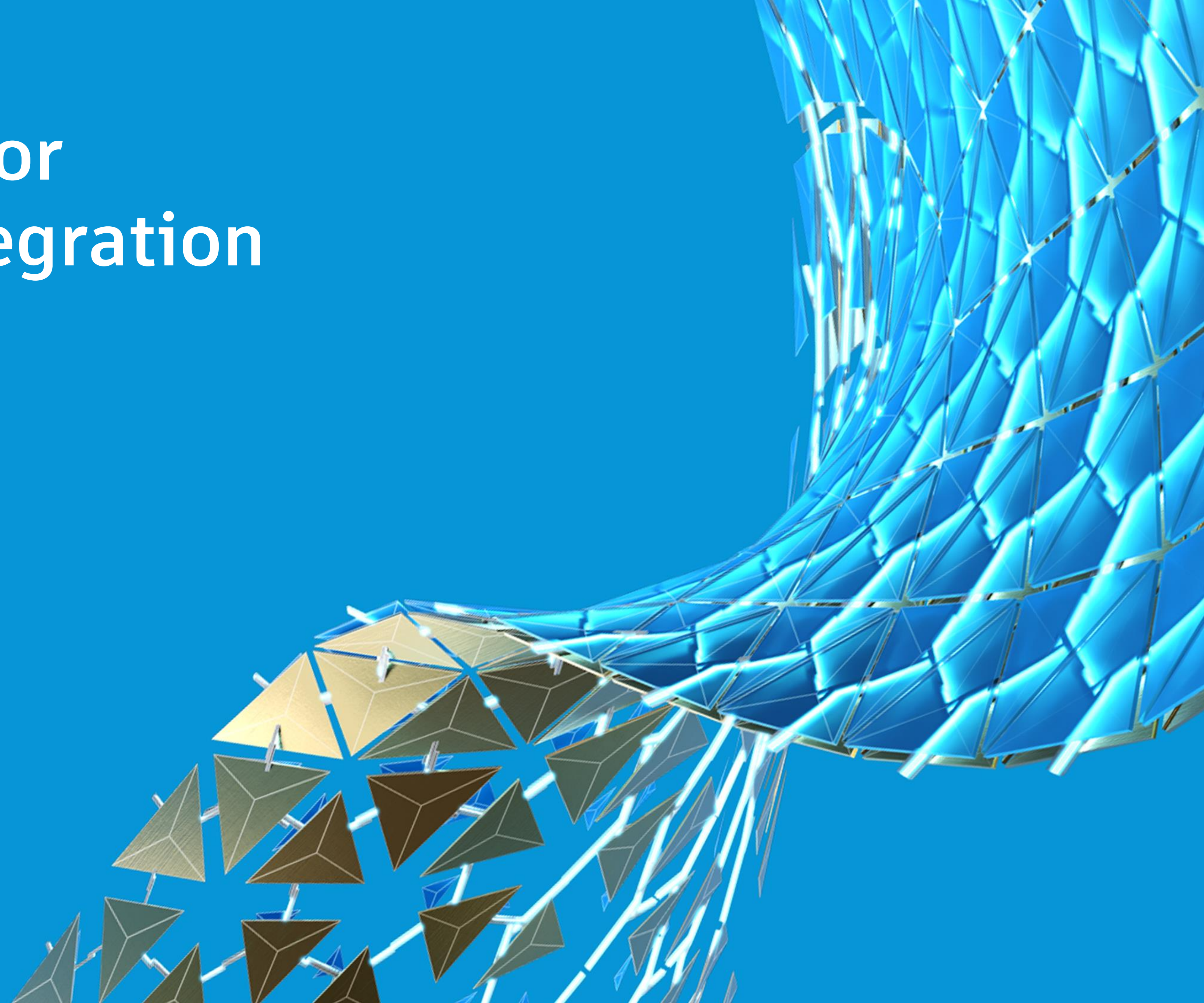
Factors Driving BIM-GIS Integration in Projects and Operations

TIME-TO-OPERATIONS

Infrastructure owners cannot afford the cost of digitizing as-built records to have operational systems up and running.

REGULATORY

Federal, state, and local governments are mandating digital handover to establish consistent practices and reporting—and to develop industry.

OPERATIONAL EFFICIENCY

BIM-GIS integration improves the ability to analyze, visualize, and respond to priority issues reducing cost and improving performance.

"SMART" CITY/INFRASTRUCTURE DEMAND

The promise of digital workflows and responsive systems has created consumer demand for smart infrastructure.

What drives your BIM-GIS integration plans and research?

Impediments to BIM-GIS Integration for Project Handover

Impediments to BIM-GIS Integration for Handover

BUSINESS PROCESS

Time, cost, contract, and warranty aspects of project handover make it challenging to provide as-built information in complete digital form suitable for integration with GIS.

COMPLEXITY, LOCATION ACCURACY, AND LEVEL OF DETAIL

GIS systems are typically unable to model the engineering complexity of as-built documents

- Geometry
- Materials
- Components
- Annotation, Sheets and Views

SCALE

The volume of digital information to accurately describe the as-built asset does not easily scale from BIM to corporate-wide GIS—but this is changing.

Impediments to BIM-GIS Integration for Handover

ORGANIZATIONAL CHANGE

Getting buy-in at executive and operational levels for the investment required is challenging.

BIM standards are complex and different across projects; data management requirements are time-consuming

COMPLEXITY AND RELIABILITY OF MULTIPLE OPERATIONAL SYSTEMS

Across the AECO industry, GIS representations of as-built and as-operating assets are often recreated from an imperfect mix of paper, PDF, and poorly verified digital sources.

"Looking at construction projects today, I do not see much difference in the execution of the work in comparison to 50 years ago."

John M. Beck, Executive Chairman, Aecon Group, Canada
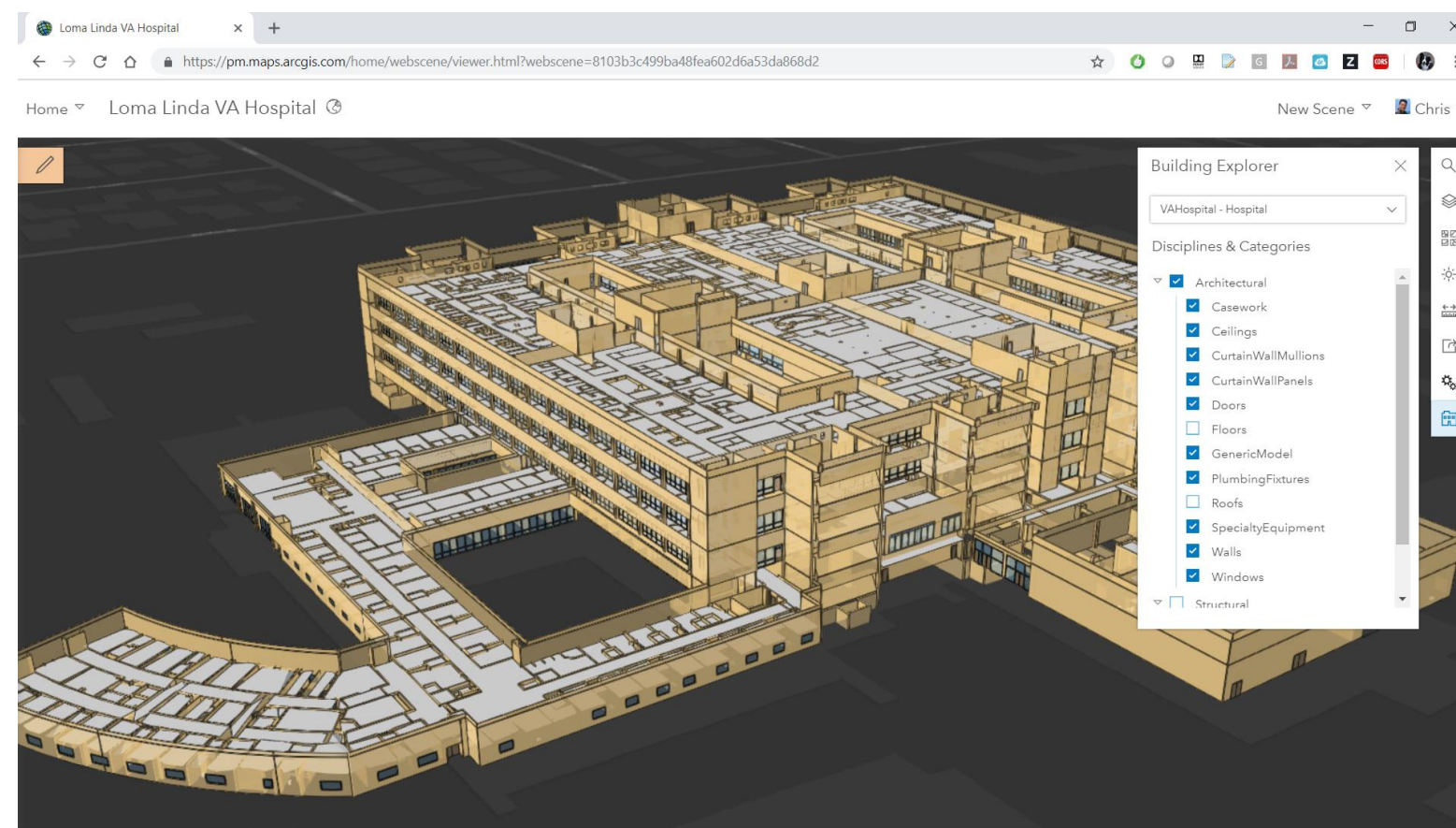
What are the top barriers to BIM-GIS Integration?

BIM-GIS Growing Closer Together
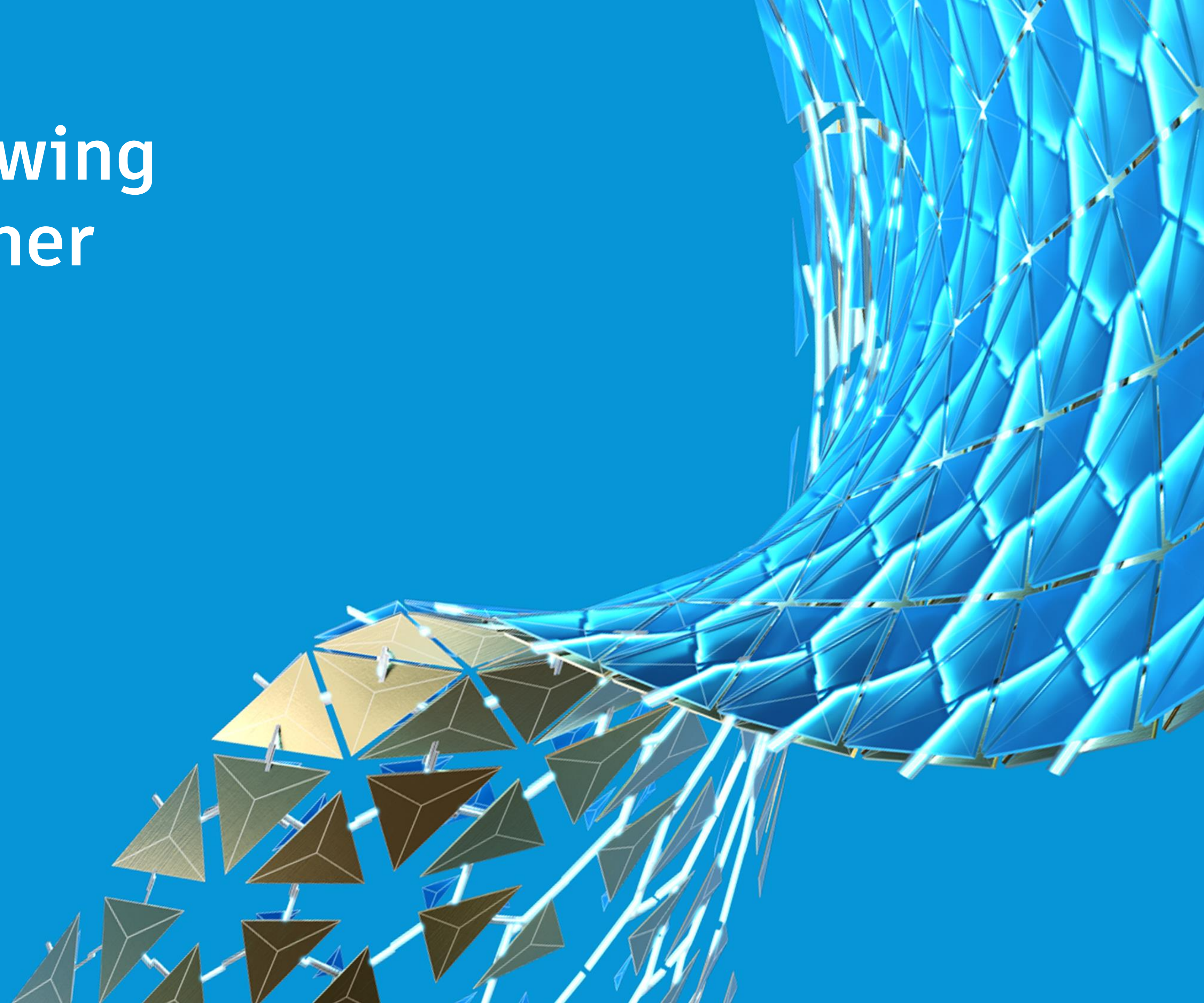
Trends

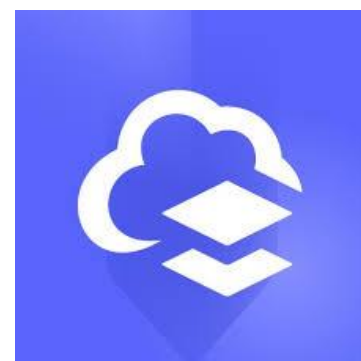## DECREASING PROBLEMS OF SCALE

COMMON DATA ENVIRONMENTS

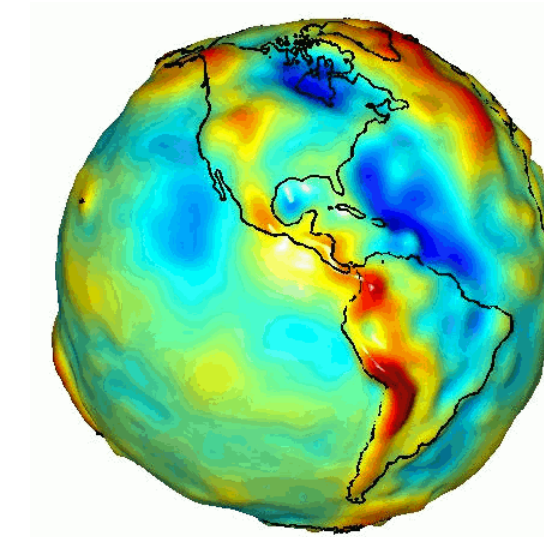**"Connected" Data Environments aggregate diverse data in a single, configurable user experience and are within reach with accelerating technology**

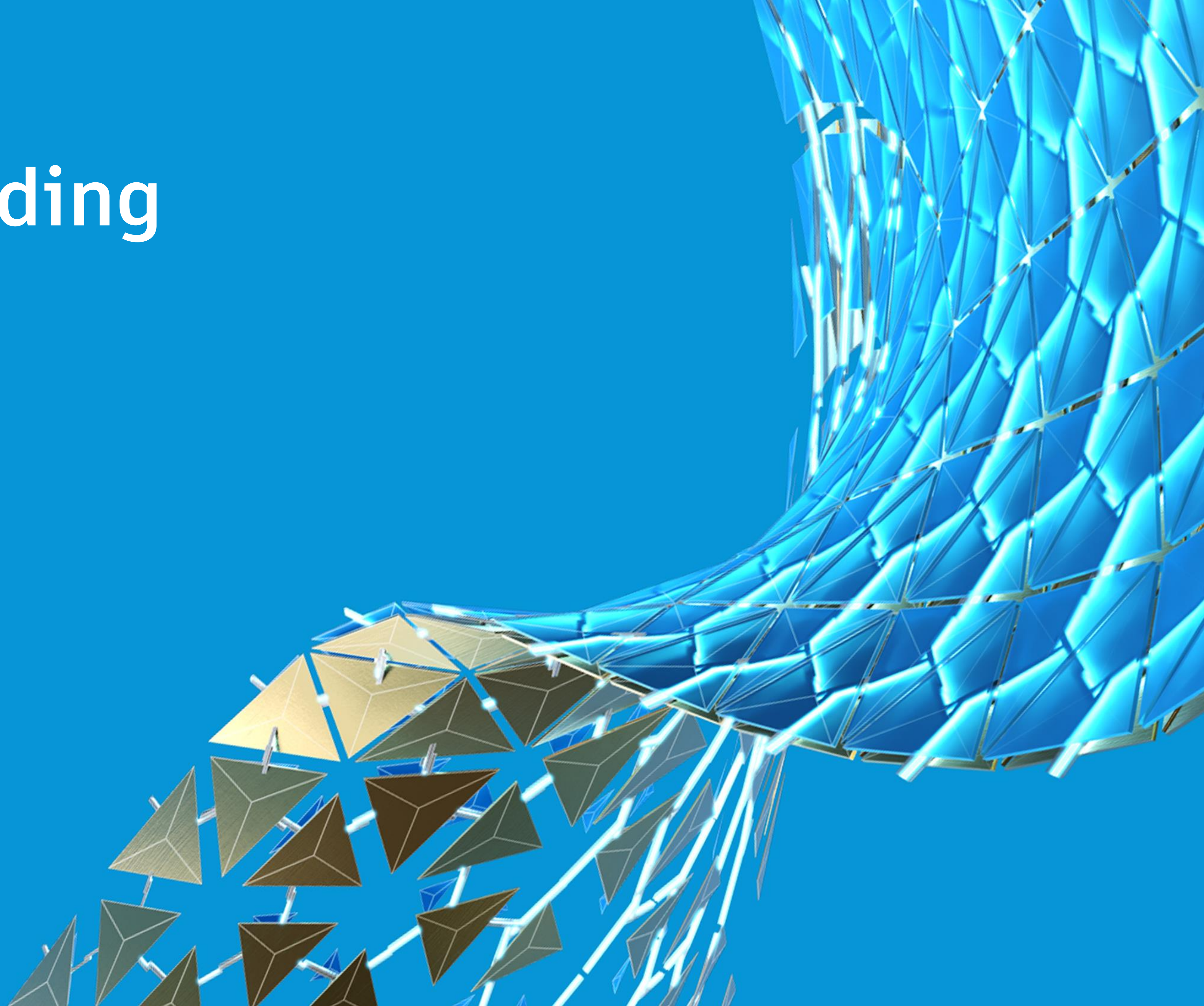## CLOUD STRATEGIES IMPROVE INTEGRATION

REST API

CONVERGENCE OF GEOMETRY AND LOCATION

What are the most promising trends for BIM-GIS integration?

Further Reading

Reference Information

GIS and BIM Integration: Common Myths and Practical Outcomes

https://www.esri.com/content/dam/esrisites/en-us/media/pdf/gis-and-bim-integration-common-myths-and-practical-outcomes.pdf

BIM-GIS Integration for Managing Large Building Stocks

https://pdfs.semanticscholar.org/eaeb/bfb124a83c451107a98b2190e470ef75685a.pdf

TU Delft, Netherlands Research is a leader in this area:

https://3d.bk.tudelft.nl/projects/geobim/

Autodesk and Common Data Environments

https://constructionblog.autodesk.com/common-data-environment/