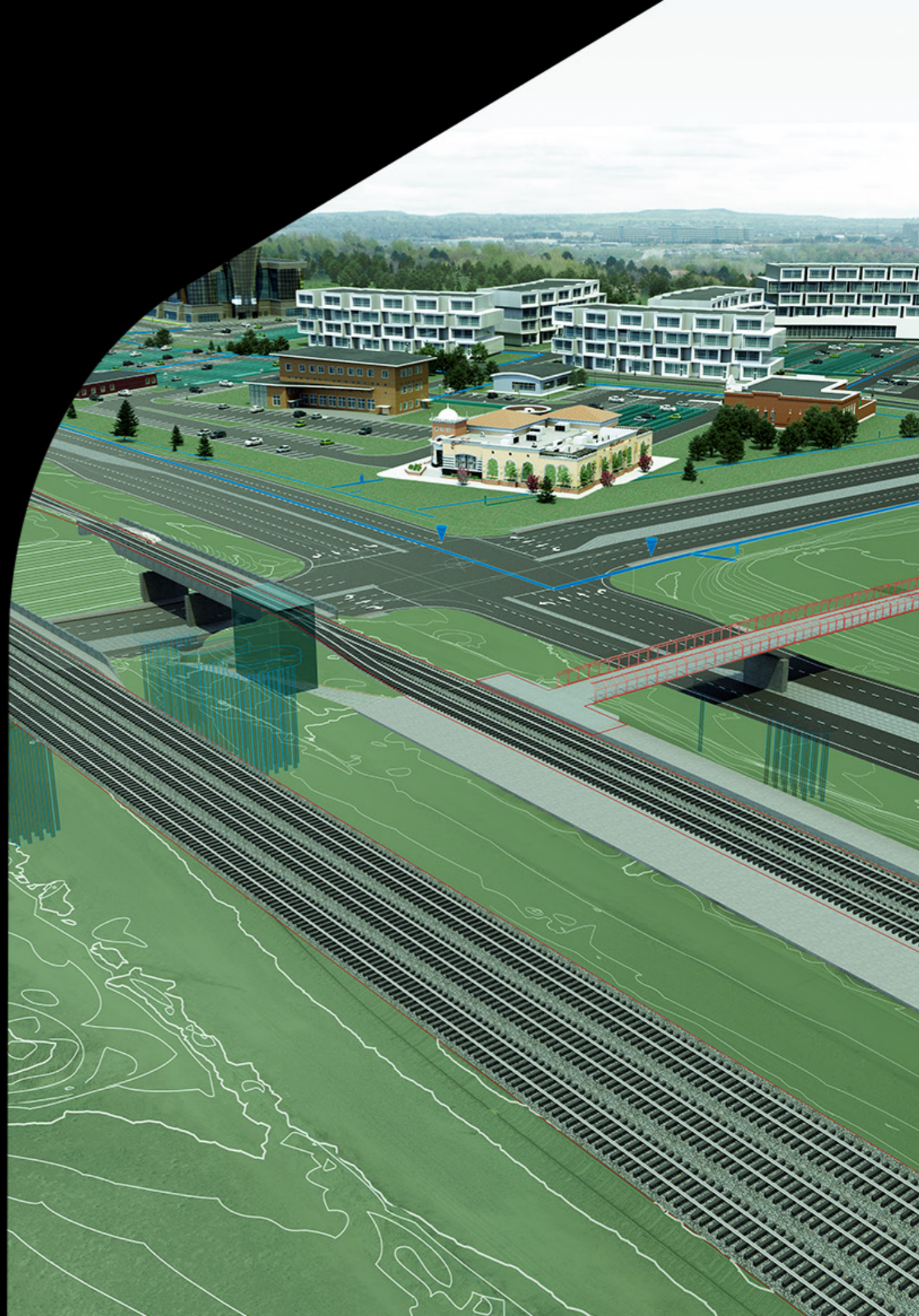




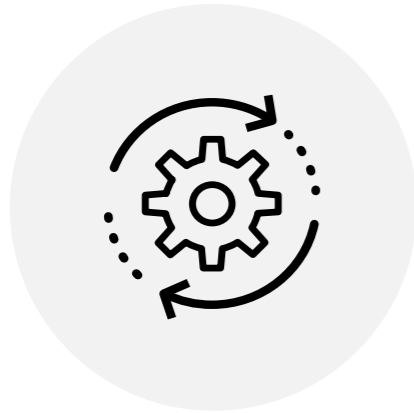
BIM+GIS

The power of design information and location intelligence, combined



Capitalize on the convergence

Combine the power of location intelligence with design information and a more holistic view of AEC projects emerges.



GIS Informs BIM. BIM Fuels GIS.

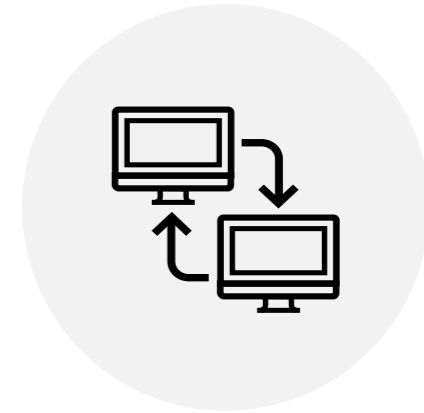
GIS informs BIM by providing a real-world context of an asset's existing environment within which designers and engineers can explore and evaluate design and construction.

BIM fuels GIS with information rich accurate models of assets that can be utilized to improve overall operations and maintenance of assets.



Gain Real World Understanding

The fusion of BIM and GIS provides the power to build a robust context model where geographic information and project design data are brought together, improving understanding about how assets interact within the context of what exists in its environment, both built and natural.



Balance Development with Sustainability

To meet today's macro-economic challenges and deliver more sustainable and resilient assets, we need more seamless sharing of data and information between BIM design processes and GIS technologies.

Breaking down barriers will help us plan, design, build, and manage assets with less negative social, economic and environmental impacts.

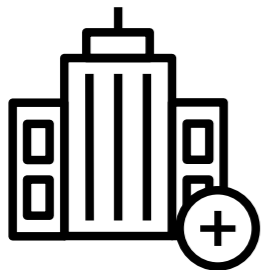
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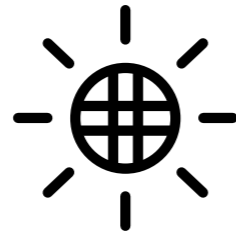
Imperatives

The world is changing fast, look at these key trends:



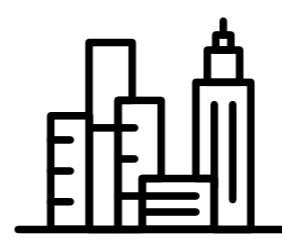
200K

people move to cities every day



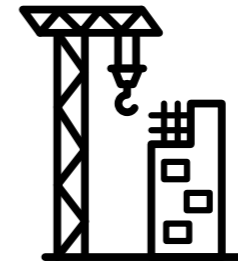
6.3B

by 2050, the urban population will increase by 75% to 6.3 billion, from 3.6 billion in 2010*



\$15T

global construction output expected to double by 2025



13K

buildings built daily and still not on pace with demand



\$3.7T

infrastructure spend needed to keep pace with demand

The ability to keep pace and have the vision to anticipate and prepare for these trends is critical to success moving forward. We need new approaches to planning, design, and asset management.

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Imperatives

Faced with global challenges, the AEC industry is shifting dramatically. The stakes are high—with the industry responsible for billions of dollars in assets, it is critical to have access to the right data to streamline processes and make more informed decisions.

Consider:



Up to **80%** of AEC projects go over budget



About **20%** miss their completion milestones



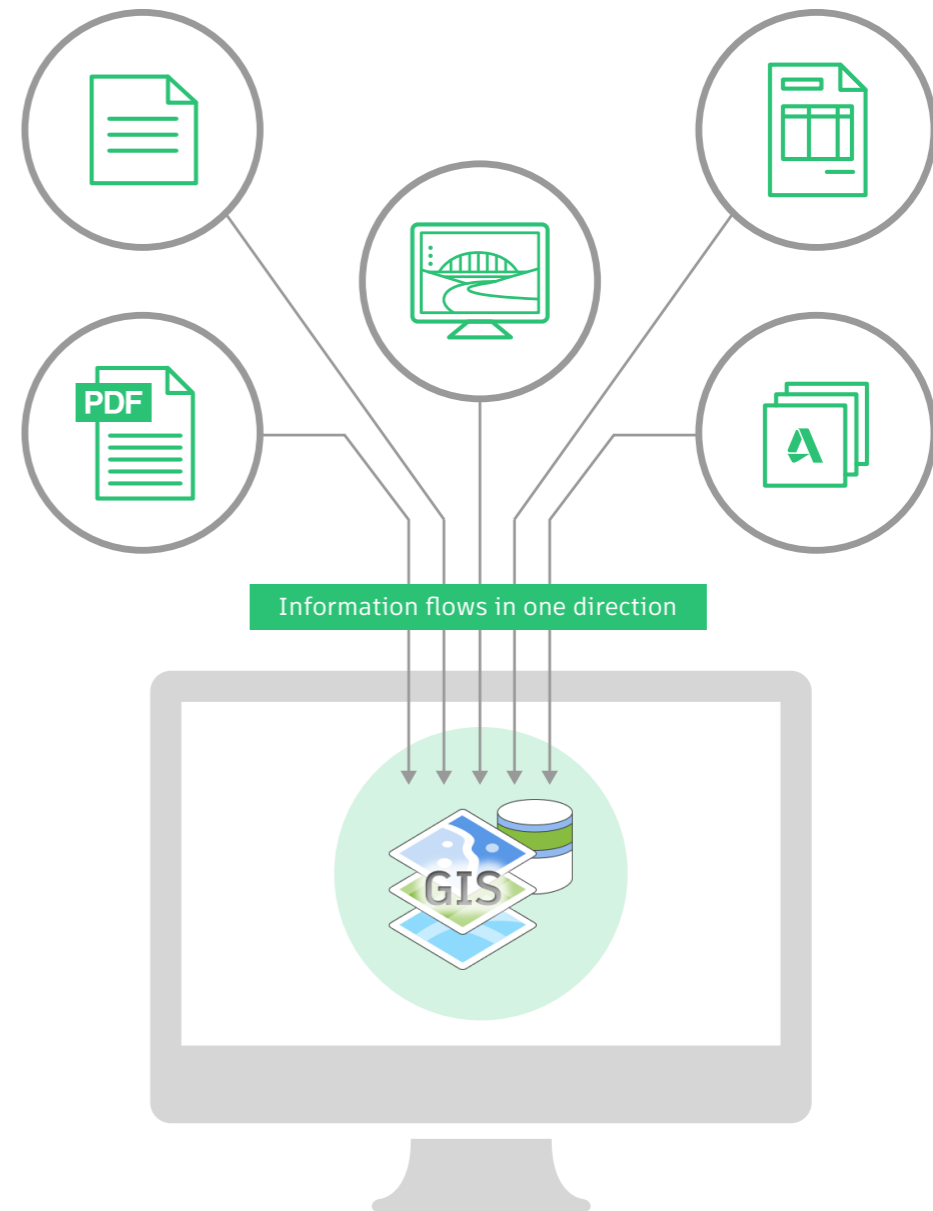
52% of all projects require rework because of poor data or communications



35% of projects experience delays and waste resources because of conflicts and rework

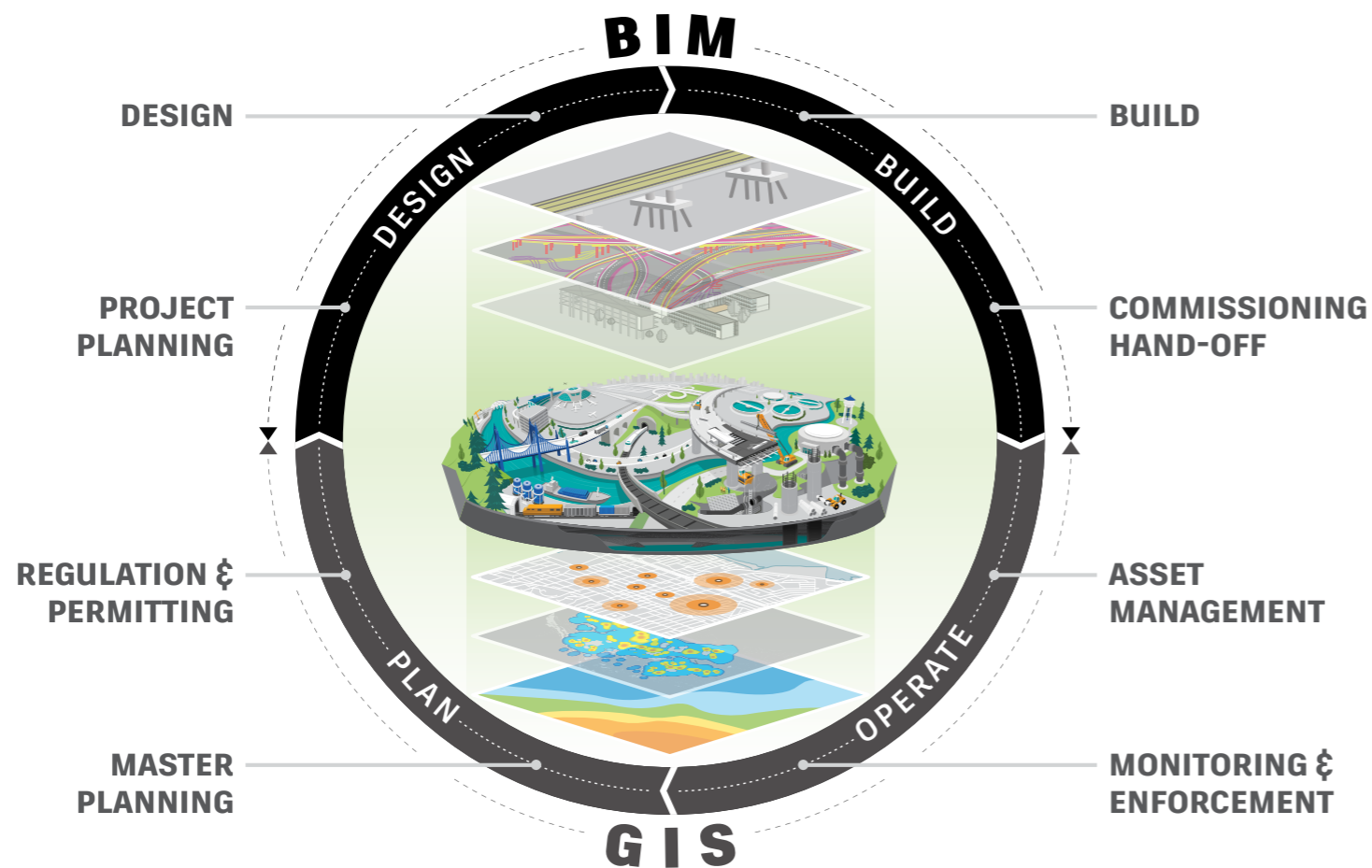
Digitalization can help improve decision-making, operational efficiencies, resource management, and project and asset management.

The Traditional Way of Working



A New Approach: Data at the Center

The AEC industry needs to think about things differently. Integrating BIM and GIS can result in workflows that move data seamlessly from one system to another. Let's take a look.



Seamless Collaboration

GIS professionals, and designers, and engineers can collaborate more efficiently across the project life cycle.

Deeper Understanding

Enable a broader and deeper understanding of projects in the larger context of our built and natural environments – allowing everyone on a project to see what the impacts are and to consider alternatives.

Better Decision-Making

Stakeholders throughout project life cycles can leverage digital information, facilitating greater engagement, improved decision-making, and accelerated approval processes.

Outcomes observed

AEC stakeholders believe that integrating BIM & GIS can facilitate better delivery of projects and also optimize the operations and maintenance of assets.



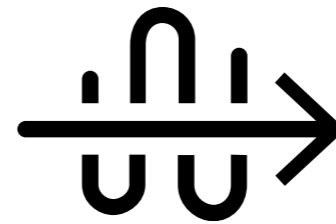
Reduced risks

59% Believe BIM & GIS integration reduces risks associated with project delays, design to execution conflicts, and more.



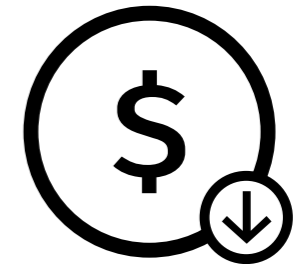
Improved collaboration

62% Organizations implemented BIM & GIS integration to streamline collaboration across multidisciplinary teams.



Better informed decision-making

55% Believe the integration of BIM & GIS provides stakeholders with access to more complete and more accurate project information.



Accelerated efficiencies



63% Organizations adopted BIM & GIS integrated solutions to enable more efficient processes throughout the project lifecycle.

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Return on Investment

| | AVERAGE DESIGN TIME SAVED | AVERAGE CONSTRUCTION TIME SAVED | AVERAGE PROJECT COST SAVED |
|--|---------------------------|---------------------------------|----------------------------|
|  <p>Small projects</p> <ul style="list-style-type: none"> • Less than 10 km in length • Less than 100 km² in area | 22.2% | 45 DAYS | 5.9% |
|  <p>Large projects</p> <ul style="list-style-type: none"> • Greater than 10 km in length • Greater than 100 km² in area | 28.3% | 90 DAYS | 13.1% |

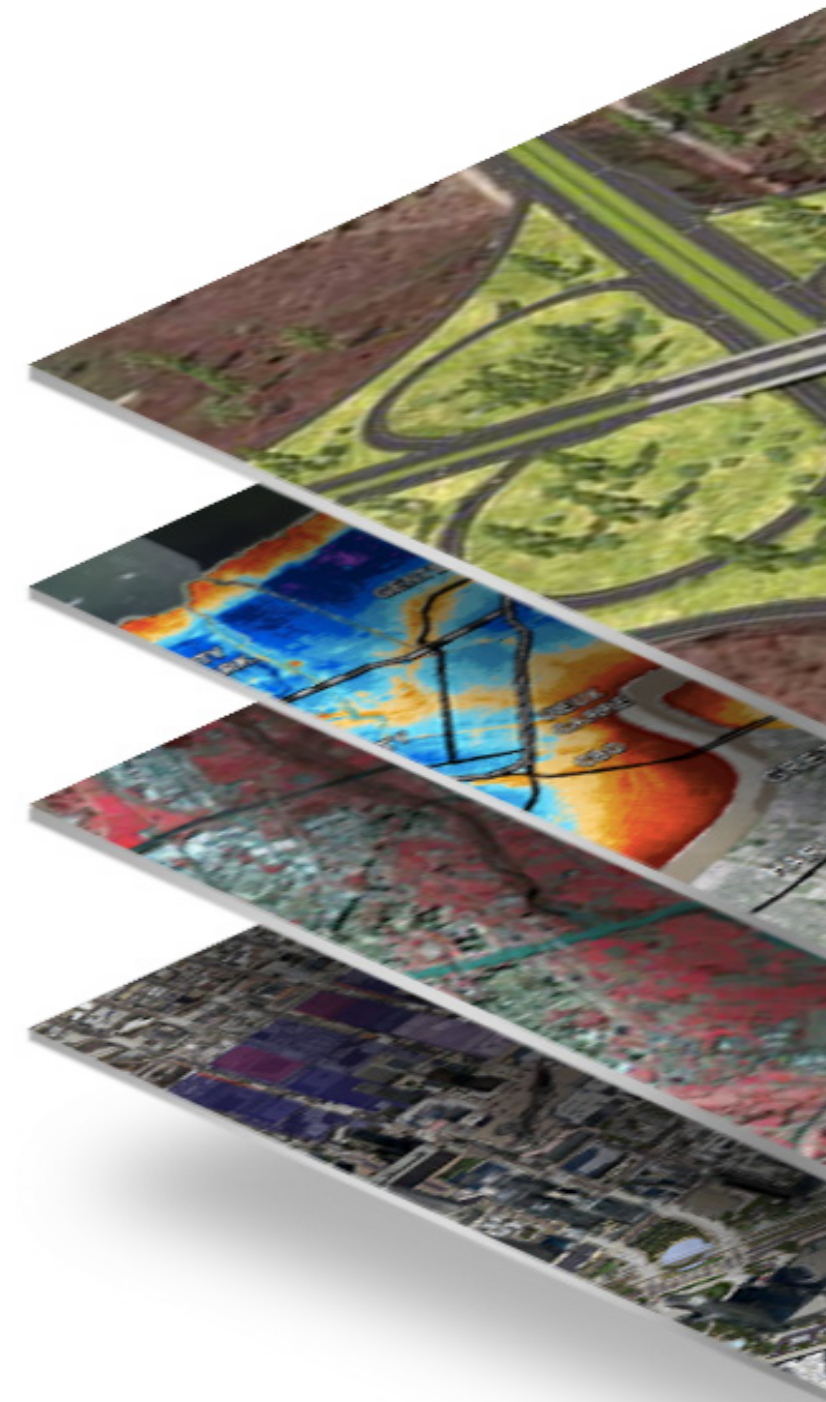
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Realized Business Outcomes

| BUSINESS GROWTH | OPERATION EFFICIENCY | REDUCE RISK | HEATH, SAFETY & SUSTAINABILITY |
|-------------------------------|----------------------------|-----------------------------|---|
| Expand and Diversify Services | Improve Collaboration | Increase Stakeholder Buy-in | Optimize Asset Life Expectancy and Resiliency |
| Improve Satisfaction | Reduce Overall Design Time | Reduce Errors and Rework | Reduce Environmental Impact |
| Improve Win Rate | Improve Data Exchange | Manage Project Complexity | Optimize Material Usage |



Transformation

Autodesk and Esri, industry leaders working together to put BIM and GIS data at the center of projects.

Benefits for AEC project teams and owners:

- Integrated and collaborative workflows that unlock opportunities and innovations
- Better understanding of projects in context
- Reduced inefficiencies
- Better project outcomes
- Delivery and maintenance of more sustainable resilient building and infrastructure assets



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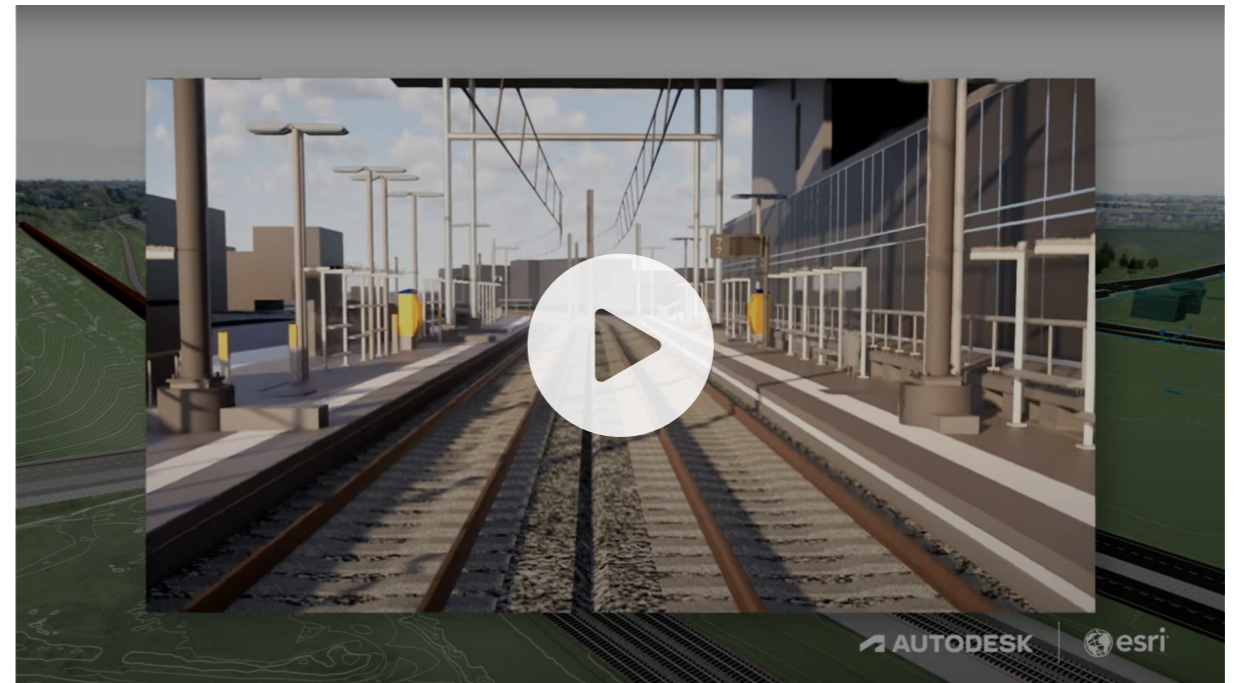
Arcadis

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Knowing that there is a partnership between those two vendors (Autodesk and Esri) is very important to us because we want to be able to connect our teams.

François Appéré
Global Autodesk Platform Director, Arcadis



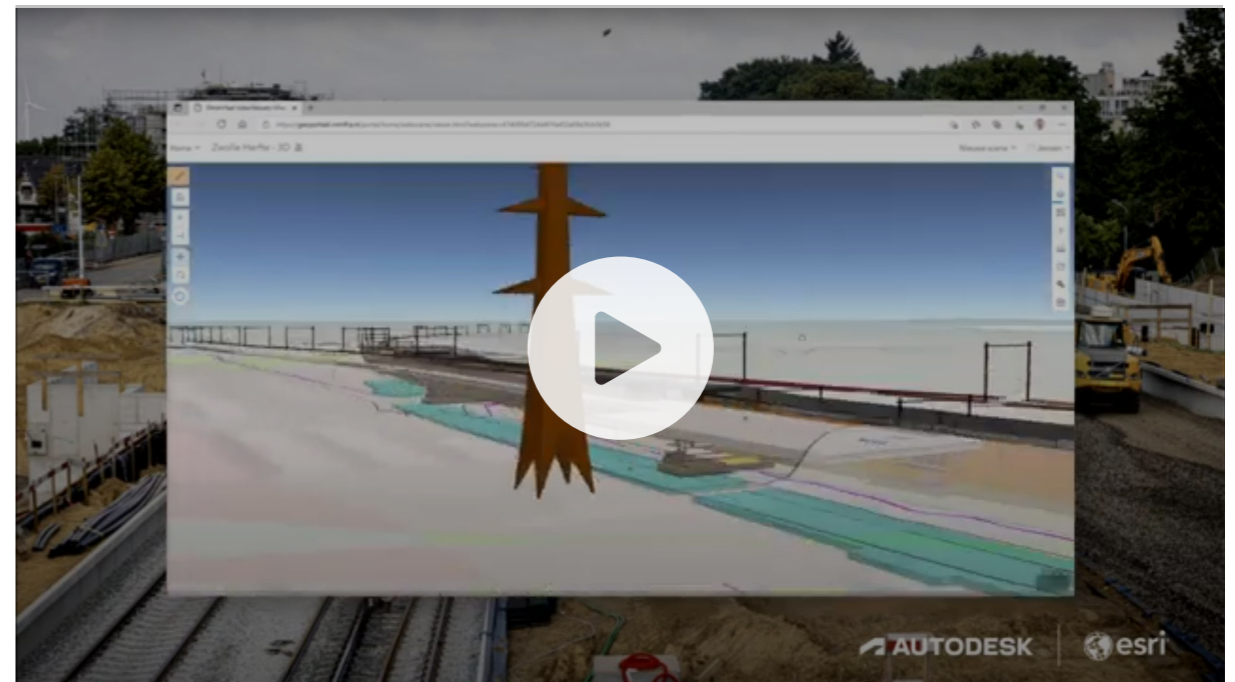
VolkerWessels

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The connection between BIM & GIS is a no brainer.

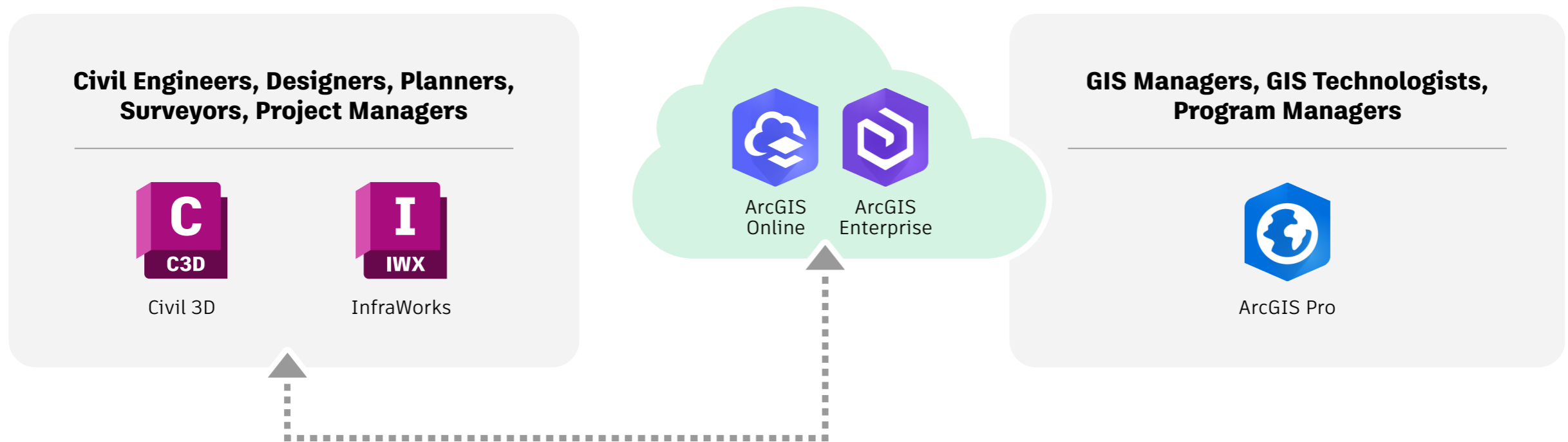
Jeroen Tishauser
Civil Engineer, VolkerWessels



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Autodesk Connector for ArcGIS

Connecting Autodesk Civil 3D and Autodesk InfraWorks with Esri's ArcGIS was the initial step to realizing the vision of the alliance.



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BIM & GIS Cloud Collaboration

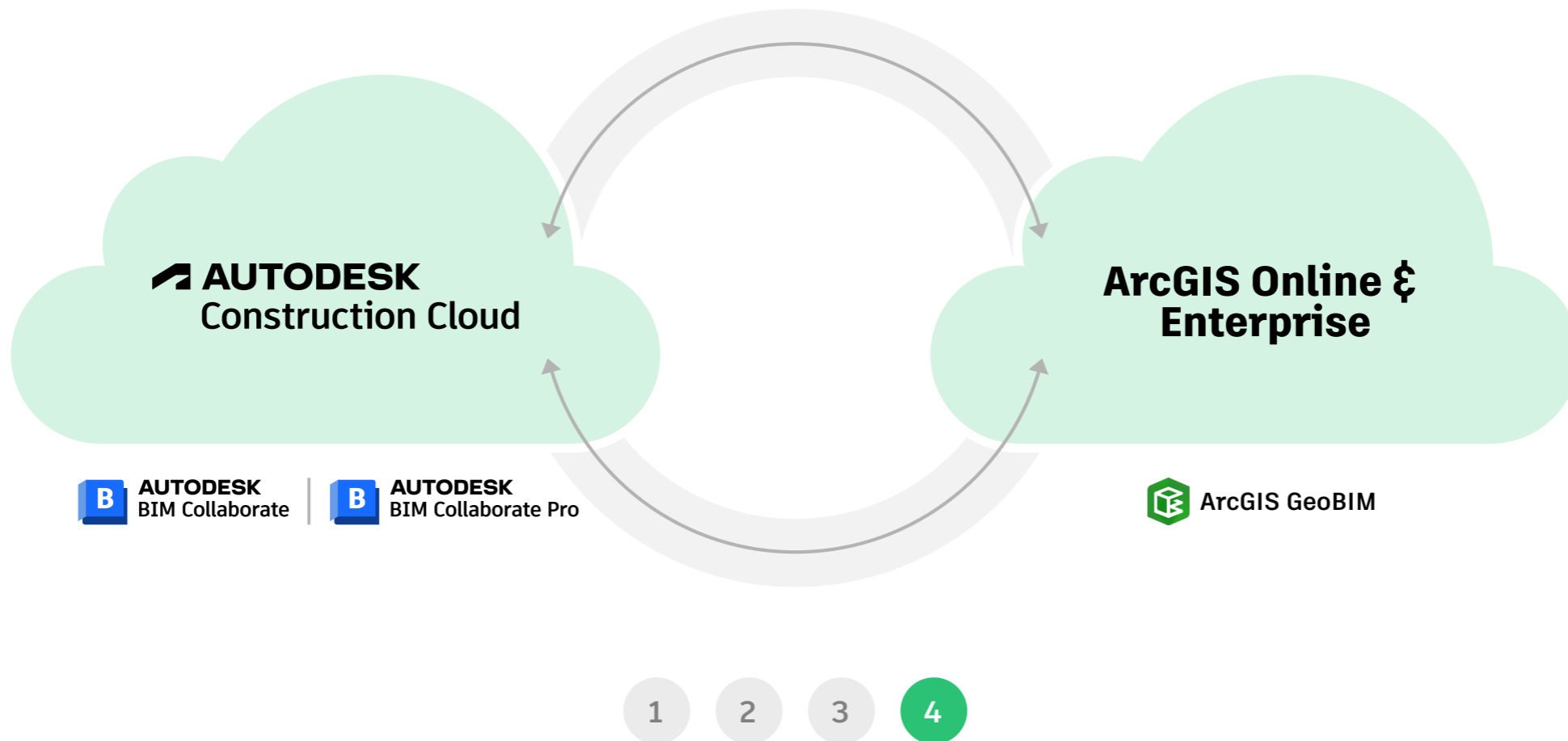
Cloud-to-cloud connectivity between Autodesk Construction Cloud and Esri's ArcGIS enables AEC teams to visualize and evaluate project information with geospatial context within a configurable web-based experience.

Owners and operators, planners, designers, and engineers can now collaborate more seamlessly, manage risks, and address maintenance issues of built assets.



The connection between Esri's ArcGIS GeoBIM and Autodesk's BIM Collaborate Pro enables the coordination necessary for our teams to design within a real-world context as we factor in key surrounding data in our design.

Darin Welch
Associate V.P., Geospatial and Virtual Engagement Solutions, HNTB



Customer Successes

VolkerWessels | BIM & GIS Innovator

The integration and visualization of design data and map data bring new insights to the geospatial understanding of any project.

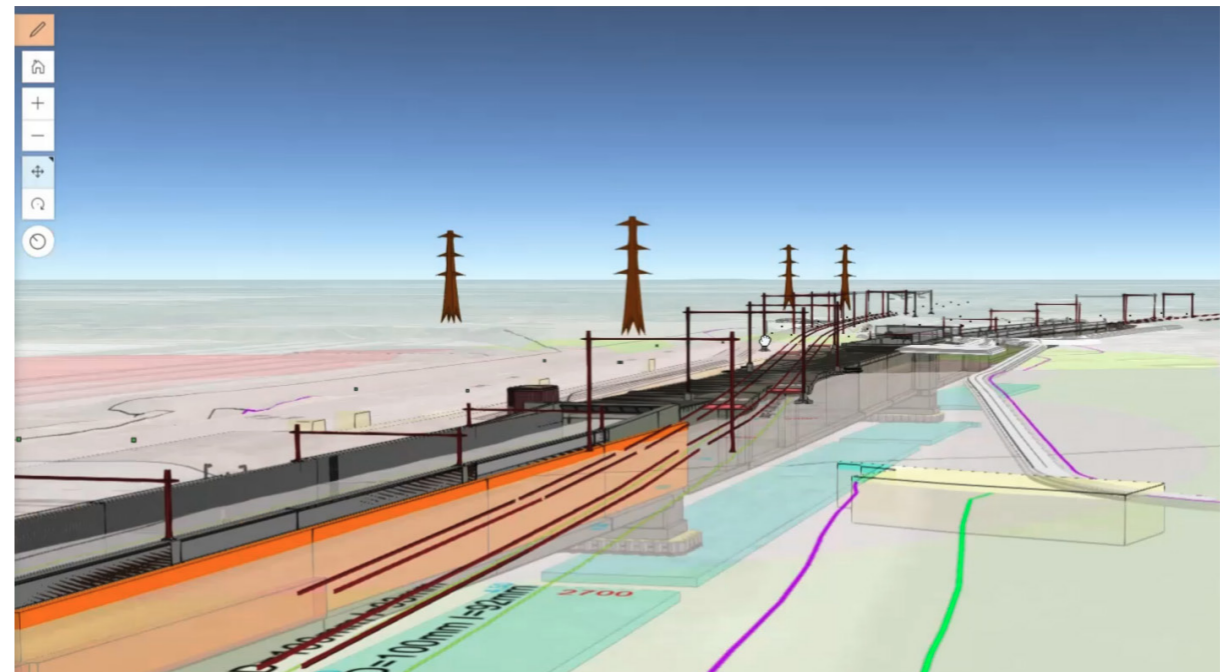
The ability to integrate design into maps means our mapping becomes more accurate and compelling. Logistics, work schedules, and inspection data are universally available, saving time where project members would otherwise check and request information from different teams and wait for a response. With the integration of BIM with GIS, all team members can view the planning processes alongside a timeline, ensuring everyone is updated on the project status and predicted outcomes.

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An integrated BIM and GIS approach forms the foundation of a project strategy in order to make the data accessible to all project stakeholders.

Jeroen Tishouser
Civil Engineer, VolkerWessels



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Customer Successes

Arcadis | BIM & GIS Innovator

Integrating information from different software solutions may be time-consuming and even redundant despite recent technology improvements.

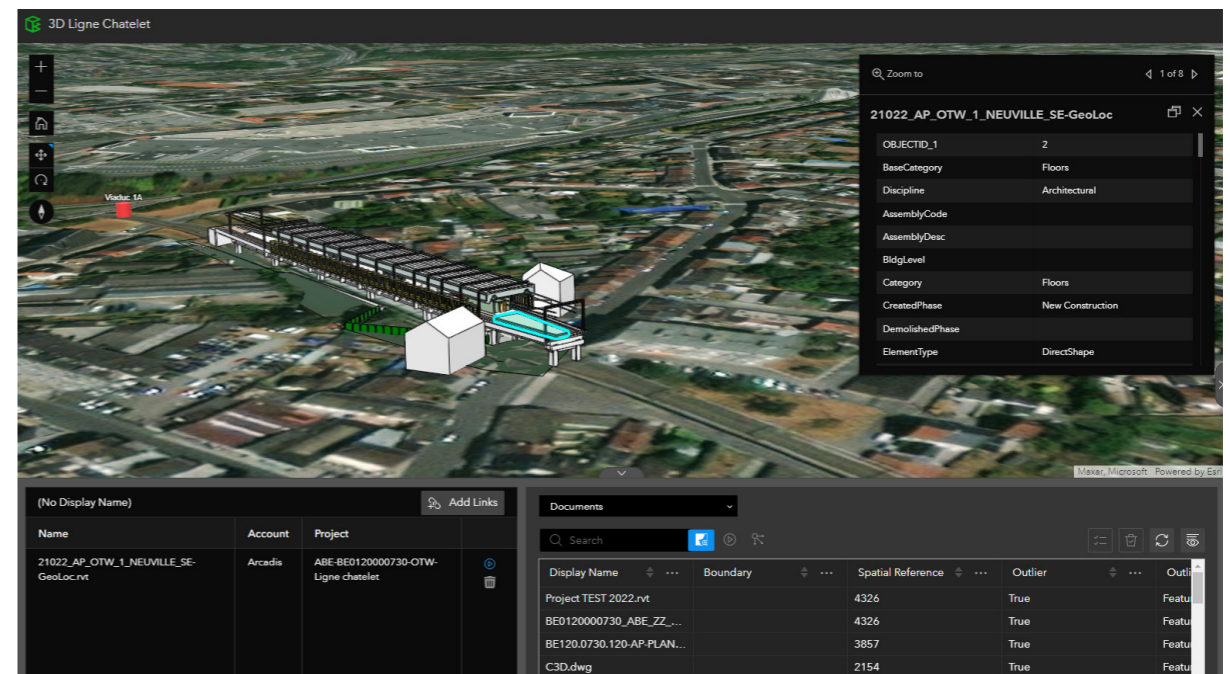
But Arcadis has invested energy in using data integration platforms like FME to automate workflows, and adding automation to our transformation processes helps ensure the design information shared through the GIS environment is up-to-date and provides value to the team. It's critical for the long-term and wide adoption of new digital workflows, as users regularly return to the shared repository to access project information.

“



Teams have highlighted the need for robust standards and agreements to connect geographic and building information successfully.

François Appéré
Global Autodesk Platform Director, Arcadis



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Customer Successes

HNTB | BIM & GIS Innovator

HNTB, a U.S.-based infrastructure solutions firm, was among the first companies to embrace integrated BIM and GIS Cloud Collaboration on a \$1.4 billion airport infrastructure project.

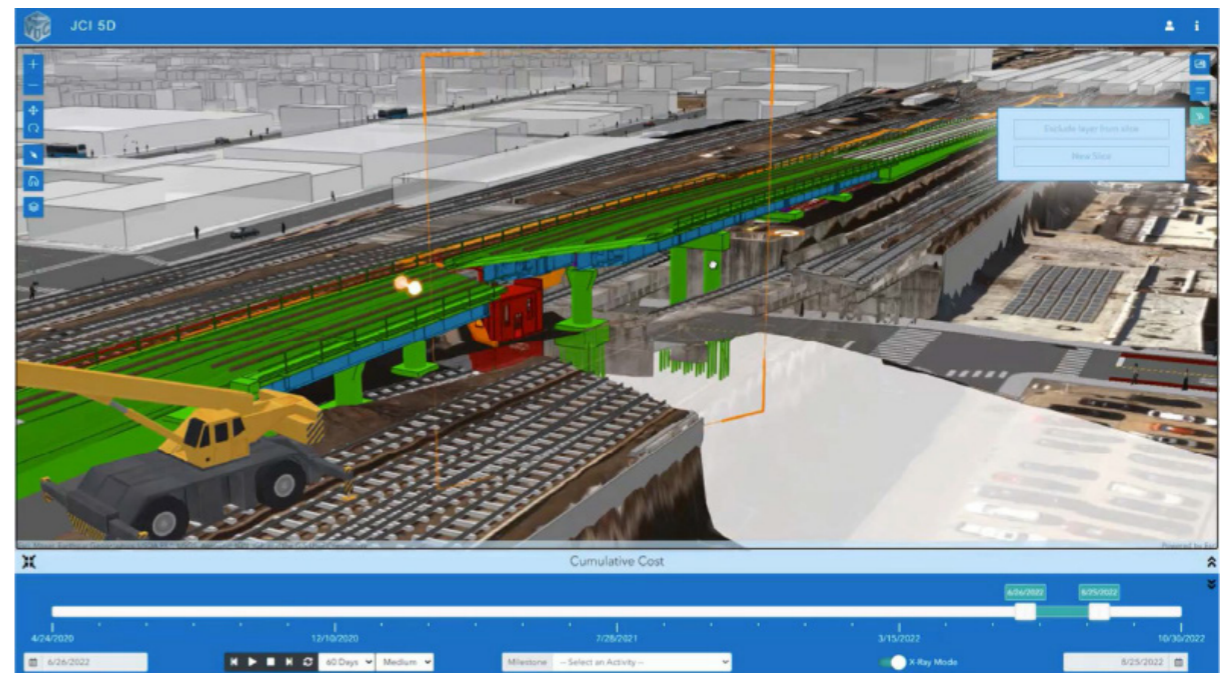
The firm's project team used BIM and GIS to guide the design and construction of a new tunnel system for utilities, baggage, and passengers at O'Hare International Airport in Chicago.

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We are on the verge of an explosive movement within the AEC industry to streamline how we overlay, understand, visualize, and analyze infrastructure design data.

Darin Welch
Associate V.P., Geospatial and Virtual
Engagement Solutions, HNTB



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Transforming BIM and GIS workflows

Together, Autodesk and Esri bridge the power of BIM and GIS to unlock innovations for public sector organizations, asset operators, and the AEC teams that support them throughout an assets lifecycle.



Visit www.autodesk.com/solutions/bim/bim-gis-integration



Resources

1. United Nations, Department of Economic and Social Affairs, Population Division (2012). World Urbanization Prospects: The 2011 Revision: <https://www.pwc.com/sg/en/real-estate/assets/pwc-real-estate-2020-building-the-future.pdf>
2. Geospatial World—GIS and BIM Integration for Sustainable AECO Industry Practices, Survey 2021: https://s3.amazonaws.com/external_clips/attachments/4177991/original/Input_Integrated_GIS_and_BIM_E-book_-_FINAL.pdf