

**BIRGIT** BIM and GIS integration  
April 2025



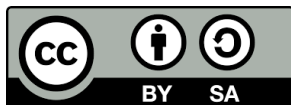
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## L2.3 BIM-GIS integration use cases

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## LEARNING OUTCOMES

**At the end of this submodule, the participant is expected to be able to:**

- Explain state of the art of the legislative on BIM GIS integration.
- Understand benefits gained from the use cases of the integration.
- Know the advantages and shortcomings of BIM GIS integration.

## BIM-GIS integration in Planning Phase

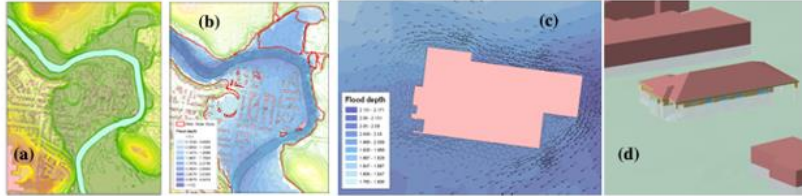
The integration of BIM-GIS in the planning phase enables simulation of the planned construction design (made in BIM model) situated at a real estate geometry and boundaries (supported by GIS).

While BIM describes a host of techniques and methods to author buildings, GIS allows to manage and analyze data that is tied to location.

Using BIM GIS Integration in Planning Phase, more precise site assessment can be made, for instance considering geographic data such as topography, water networks, environmental conditions, enabling optimal site selection and more efficient design

# BIM-GIS integration in Planning phase - case study Flood analysis

Flood analysis to find the best location or structure of a facility/asset



Case study for a house in Maribyrnong: (a) study area, (b) flood simulation output in the area, (c) flood parameters around the house, (d) 3D visualisation of the inundation level for the house



3D Visualisation of Damaged Walls (left), Doors (middle) and Flooring (right) in ESRI ArcScene

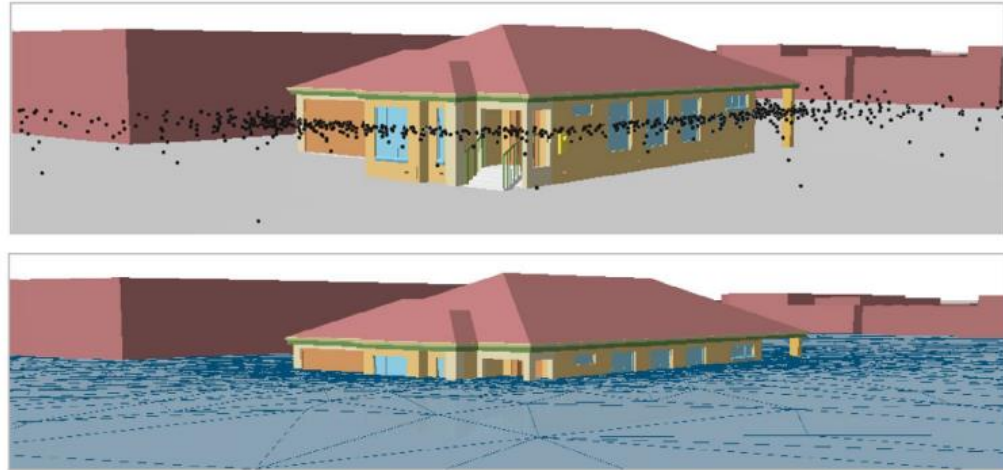
Image web: <https://www.tandfonline.com/doi/abs/10.1080/14498596.2016.1189365>



## BIM-GIS integration in Planning phase

Results of such integration  
during planning phase:

successfully avoiding  
flooding area to build a  
house





## BIM-GIS integration in urban planning and design process

BIM GIS integration significantly improve the design of more environmentally friendly urban environments

GIS supports decision making and policy making by enabling spatial analysis, data visualization, and scenario modeling, while BIM supports maintaining smart city infrastructure, including utilities, transportation, and public spaces. BIM allows for real-time monitoring and predictive maintenance, minimizing downtime and improving service delivery

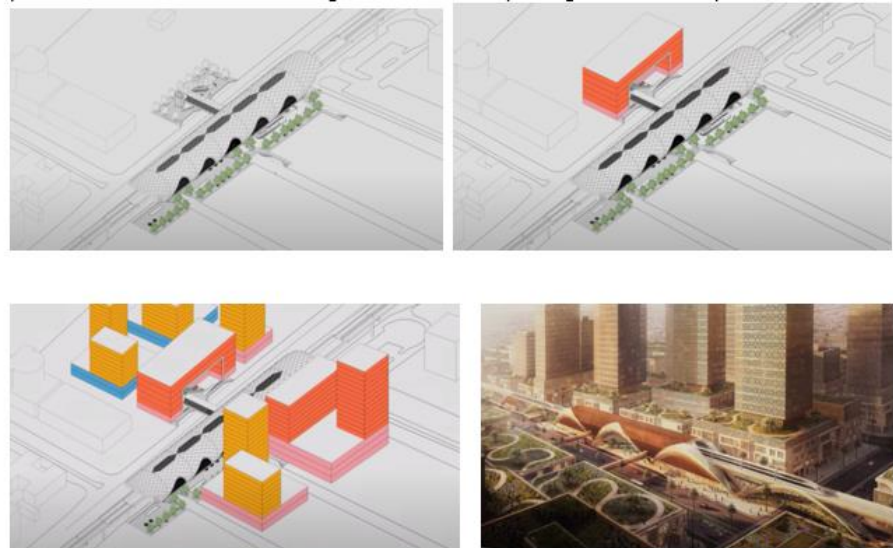


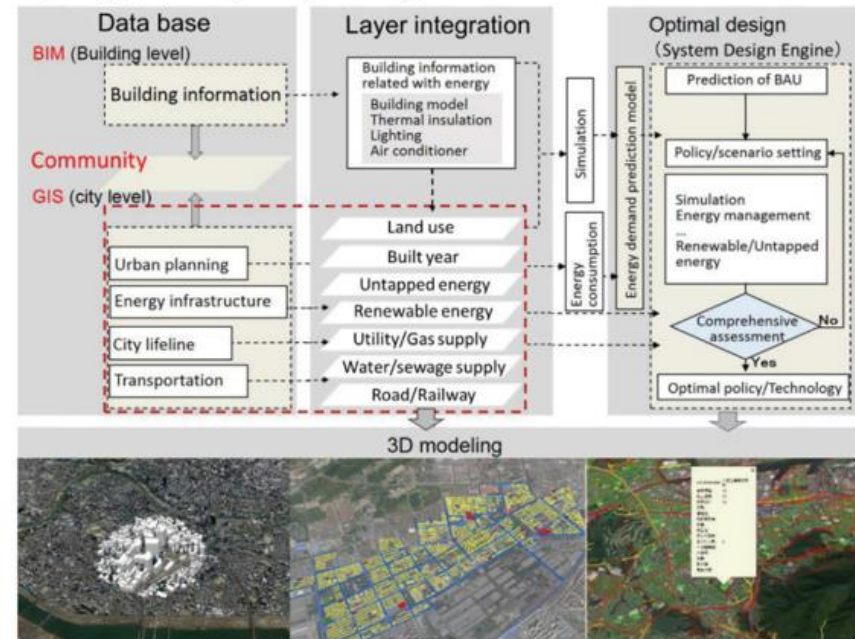
Image web: <https://www.youtube.com/watch?v=XyYW1WM4C0g>



## BIM-GIS integration in urban energy performance

Case study: a GIS-BIM integration applied on urban energy planning system to access the optimal technical and policy solution for readjust city infrastructure

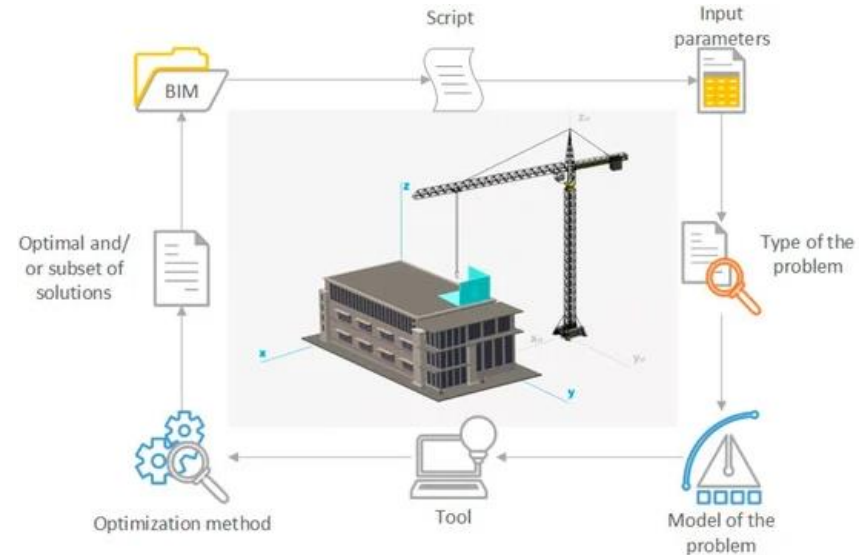
Figure shows combination of GIS data and BIM data, which integrated gives model on which prediction and simulation can be performed to simulate effect of energy conservation



## BIM-GIS integration in construction – tower cranes

Optimization for a construction site to locate the tower cranes

Once the geometry of the construction site is generated by the BIM tool, the model determines the proper combination of tower cranes in order to optimize location and then generates 3D models to visualize the optimum location of tower cranes → as a result, potential conflicts are detected in different 3D views in order to identify the optimal location



## BIM-GIS integration in traffic simulations

Use case: traffic simulation in Paris

Integration opens possibility to analyse the impact of restricting access to a road, constraining movement in a single direction, or introducing an intersection

A 3D design model can simulate dynamic changes and their implications, facilitating stakeholder buy-in during the decision-making process

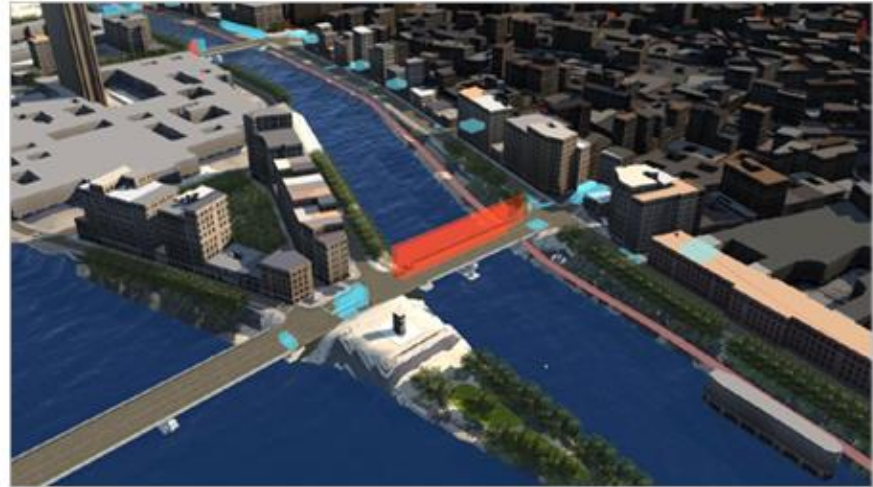


Image web: <https://autodesk.wistia.com/medias/dc2qc1te9q?embedType=async&videoFoam=true&videoWidth=640>

## BIM-GIS integration in traffic simulations

Use case: pedestrian zones

Integration opens possibility to analyse the impact of restricting access to a road, constraining movement in a single direction, or introducing an intersection

A 3D design model can simulate dynamic changes and their implications, facilitating stakeholder buy-in during the decision-making process



Image web: <https://www.bimcommunity.com/news/load/382/beneficios-y-complejidades-del-gis-y-el-bim>

## BIM-GIS integration – EU's direction for the future

the EU has been promoting the use of BIM and GIS technologies in various ways to improve infrastructure planning, construction, and management.

There are directives and regulations related to data sharing, interoperability, and open standards that indirectly influence the integration of BIM and GIS.

Various EU initiatives and policies indirectly support the adoption and integration of these technologies.

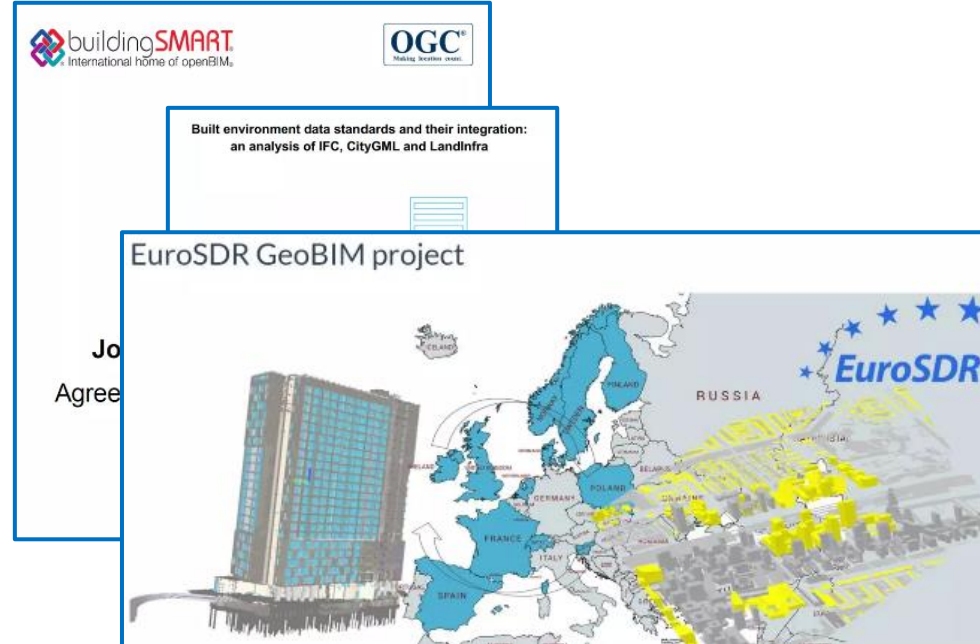


Image credit: Shanghee Shin, web url: <https://www.slideshare.net/endofcap/integration-of-bim-and-gis-from-ideal-to-reality>

## „Priceless” advantages of BIM-GIS integration

- ✓ **Enhanced Decision-Making**
- ✓ **Improved Collaboration**
- ✓ **Data Consistency**
- ✓ **Asset Lifecycle Management**
- ✓ **Sustainability**

## Remained challenges for the BIM GIS integration still a head of us

- Data Compatibility
- Data Quality
- Coordination and Collaboration
- Standards and Interoperability
- Data Volume and Complexity
- Data Updating and Maintenance
- Integration Tools and Software
- Privacy and Security
- Training and Expertise
- Costs
- Change Management
- Legal and Licensing Issues
- ...





**Thank you for your attention**



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