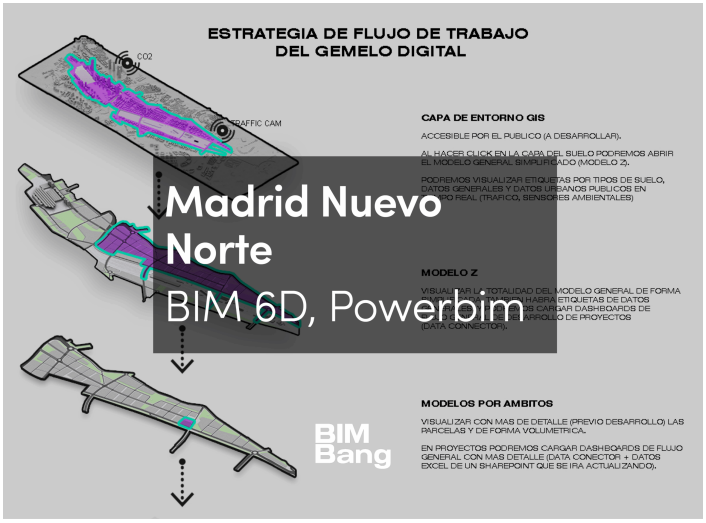

BIM 6D: DIGITAL TWIN FOR MADRID NUEVO NORTE

Posted on December 18, 2025 by gaiapilia

Categories: Middle Density, Project, Technology and fabrication, Uncategorized

Tags: bim, BIM Academy, BIM in practice, collaborative process, Digital era, Sant Feliu de Llobregat, Sustainability, Urban Development

ISSN : 2575-5374

Digital Twin Platform for one of the largest urban regeneration projects in Europe

Madrid Nuevo Norte is Madrid's big 21st-century project. The most important urban transformation action that the capital of Spain is going to experience and one of the main ones in all of Europe, designed to improve the quality of life of its citizens, creating a more efficient, sustainable and prosperous Madrid.

The project arises from the need to integrate the Chamartín station and all the railway facilities that depart from it within the city. This urban regeneration action will not only close this wound, solving problems of mobility, security and lack of public services, but it will succeed in placing Madrid in the group of cities that will best be able to face the great economic and social changes of the next decades.

ISSN : 2575-5374

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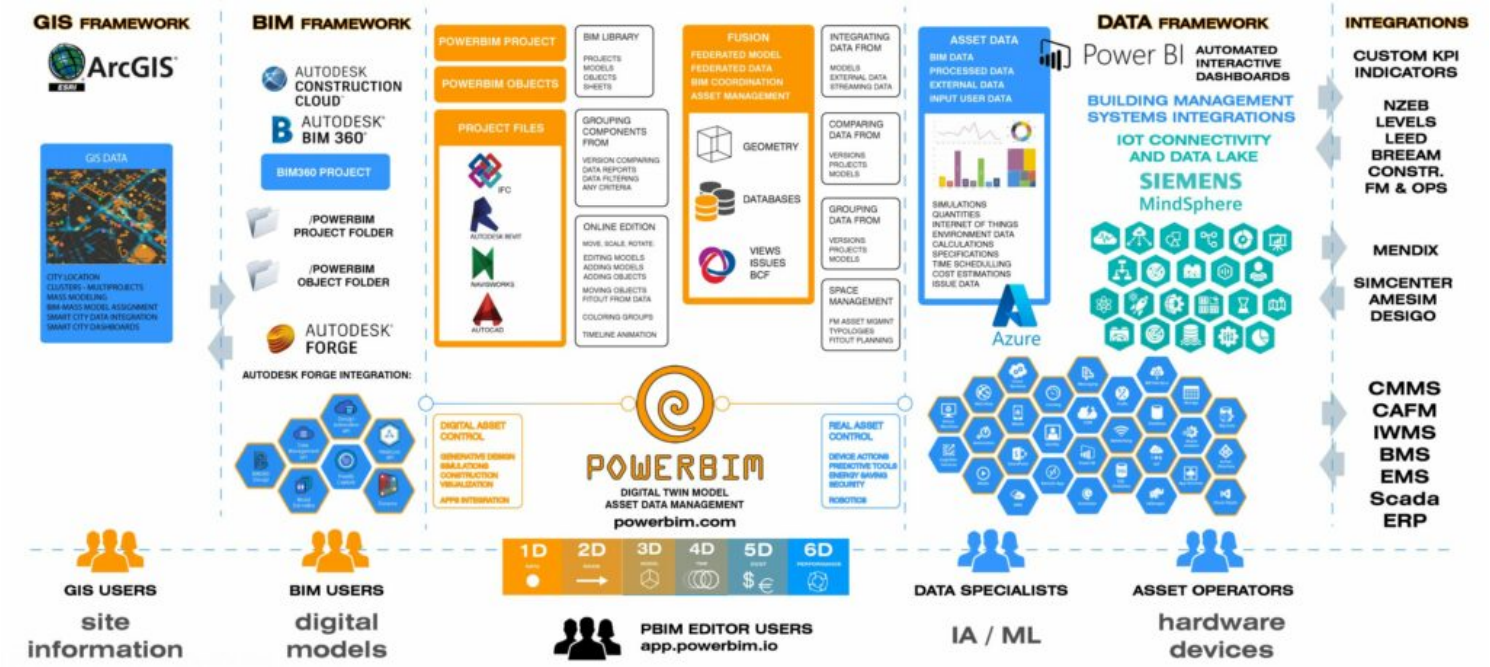
A Digital Twin to Manage All Project Development in a Multiscaled Environment

The Madrid Nuevo Norte project becomes the first major urban development to be certified in the use of the BIM methodology in Spain, this means that all projects, from the begining will be developed in BIM methodology under the same standardized BIM protocole. Also, GIS technology is being used from the beginning as well to geolocate all project while at the same time multiple layers of information are being developed.

The challenge is to get to manage a huge amount of data coming from multiple projects in evolution, and not only this, Madrid Nuevo Norte is getting control of all processes in a unique digital ecosystem that is able to follow up all review, approvals and data transfer between multiple

ISSN : 2575-5374

platforms that are synchronized, and part of this sucess is thanks to POWERBIM DigitalTwin platform, that is able to integrate a Common Data Environment (Autodesk Construction Cloud) to other platforms like Microsof Sharepoint for Data Synchronization or Microsoft Power BI for Data Analytics, or GIS technology in a seamless way.



POWERBIM DigitalTwin Ecosystem in where multiple technology data is synchronized to let different stakeholder's roles to collaborate without loss of information

One platform - multiple scales connected in a workflow

The implementation of a Digitaltwin platform for a project of these characteristics, in where the size of digitalmodels and multiple scales and typologies of developments are integrated, because here infrastructure projects are combined to urban regeneration projects that are surgical, with building and urban projects, public and private are combined. Everything is managed from a master plan that is continually evolving and transforming as projects arise, and here, from minute 1, we have worked to develop a pioneering strategy that consists of applying a multi-scale digital twin system that allows us to address key aspects that we will identify:

ISSN : 2575-5374

- The large size of the models implies great difficulty in generating federated BIM models that need to be coherent, it is really difficult if we are talking about multiple projects evolving at different speeds and with multiple actors working at the same time
- The use of a CDE is a key, and this has been implemented from the beginning. By using POWERBIM in combination to Autodesk Construction Cloud systems, we propose to integrate all the information that comes from the CDE but also from other external sources of data that are being connected.
- In this scheme we have created a multiscaled system so that from a general GIS model on an urban scale, with a single click we can access the BIM models for these areas developed in more detail.

Users can navigate trough models from general to detailed, from GIS to BIM, in a seamless workflow in just few clicks. It's like having a model within another model, with more and more detail, where we can easily go navigating to models and links with relevant information that is accessible in seconds, and being able to jump from an urban scale to that of a specific project, without having to have a huge federated model with everything in there.

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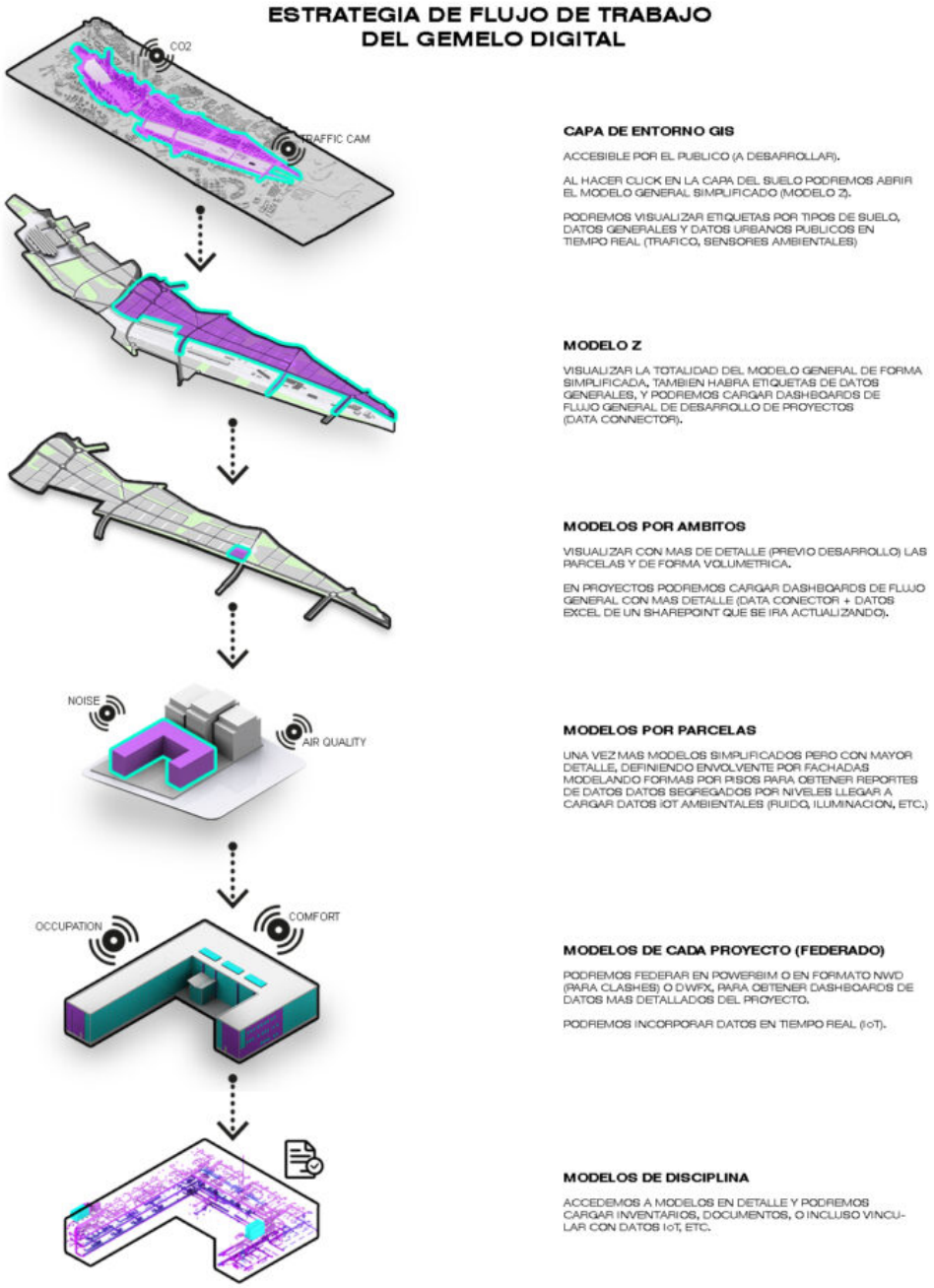

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DigitalTwin methodology

In a first step, we can begin to organize the assets and various layers of information within the territory itself thanks to the GIS technology in the cloud that we have integrated to POWERBIM. We can incorporate data in real time from mobility, cameras, sensors… In the GIS viewer we can insert volumetric shapes or digital models.

Digital Models are connected to the Autodesk Construction Cloud accessing all projects created there, POWERBIM can acces for each one to all project management workflows (reviews, transfers, issues). To do that we have created an integration between ACC data connector and POWERBIM Power BI reports, so we can automatically create a general dashboard from all CDE workflows and to interact with all projects massively in a data dashboards while at the same time each project have a digital representation in a “general simplified urban project” accesing to individual BIM projects in a single click.

Automated Data Analytic Dashboards connected to BIM

In POWERBIM we can create custom Power BI dashboard templates that will automate the generation of data analysis of BIM models, in this case we are applying an audit template that verifies compliance with EIR – Exchange Information Requirements, so that in one click we create an information quality control audit.

BIM Collaboration - Synchronized Issues between CDE and POWERBIM

By clicking on elements from a Power BI report, we can generate a group (asset), and assign this group to an issue, once this issue is created in POWERBIM it is synchronized in Autodesk Construction Cloud and vice versa, we read the Autodesk Construction Cloud issues in the models of POWERBIM, in addition to being able to export or import these incidents in openBIM BCF format.

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Clashdetection Dashboards enhanced with more information

In this other video we want to show how we can integrate the results of clashdetection into interactive reports with the model, so that each circle in the data report is a clash and when clicked, the objects that are part of the clash are marked in the model, The interesting thing here is that we can combine the information from the clashdetection result with any other information that is in the model, levels, classification systems, whatever we want to incorporate and in this way we can select in a massive way all the clashes that meet a criteria of attributes, create a group of all these elements and generate an issue for all of them and not go one by one.

ISSN : 2575-5374

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