

2017 Winter Conference

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Seminar 55, Urban-Scale Energy Modeling, Part 4

Virtual UBEM: Visualizing, Analyzing and Reporting

Learning Objectives

- Optimization by climate zone for energy efficiency of neighborhood building morphology
- Describe how UBEM can be used to make well-informed utility planning decisions.
- Recognize significance of analytical problems that can be addressed at urban scale that cannot be well addressed at the individual building level
- Recognize key structural and operating requirements for an urban-scale energy modeling platform

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Outline/Agenda

- What is Reality Modeling?
- Image-based 3-D Reconstruction
- Campus
- Leveraging Building Information Modeling
- Goal – A Virtual Campus
- Integrating BIM, GIS, and Enterprise Data
- Modeling the Campus
- Visualize Space Utilization
- Subsurface Utilities
- Conclusions

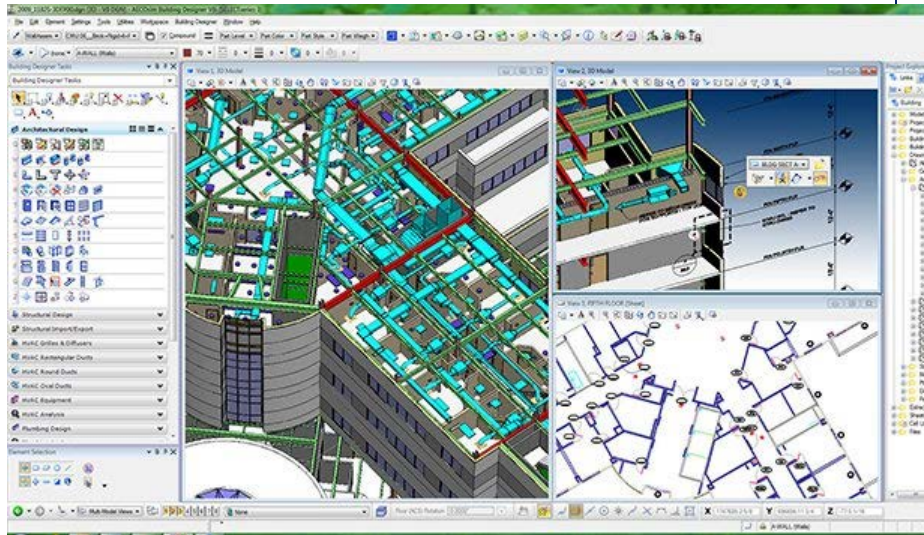
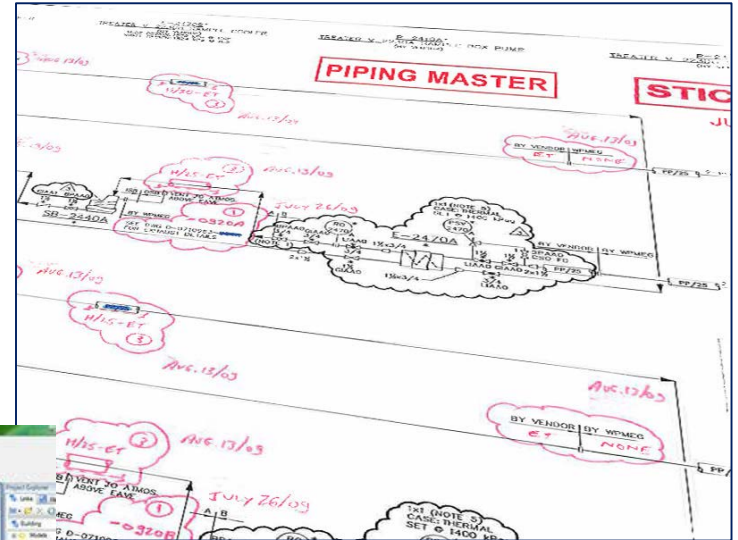
What is Reality Modeling?

- Images & video



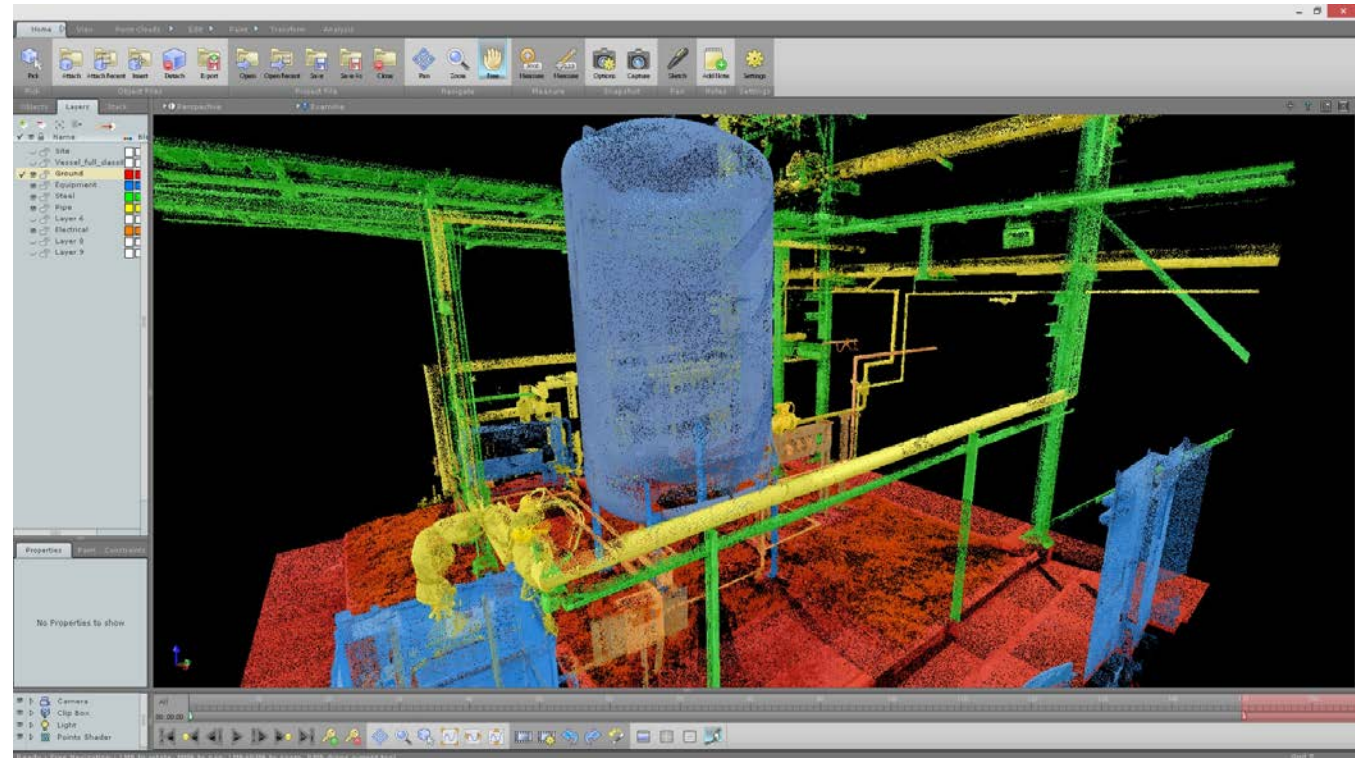
What is Reality Modeling?

- Images & video
- As-built drawings & models



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What is Reality Modeling?

- Images & video
- As-built drawings & models
- Point clouds
- Image-based 3-D reconstruction

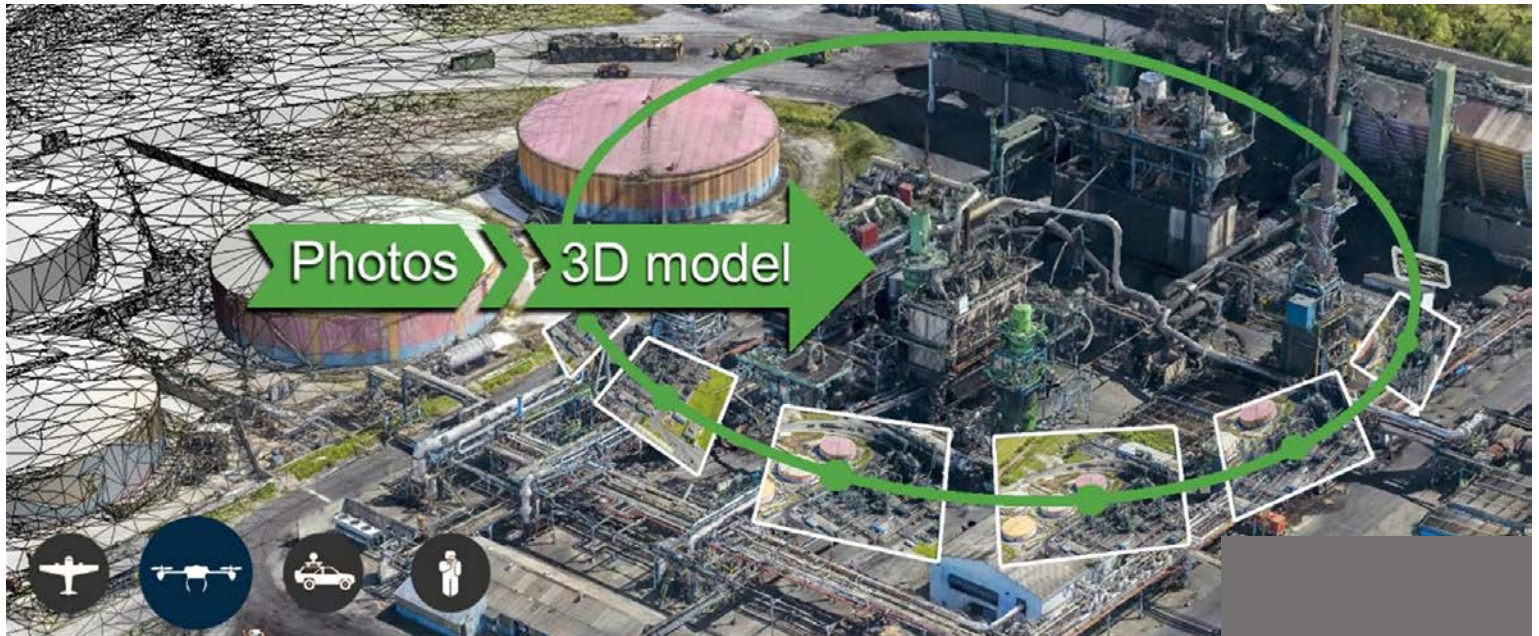


Image-based 3-D Reconstruction



Image-based 3-D Reconstruction: Process

CAPTURE



PROCESS



Reality Model
Scalable Mesh

CONSUME

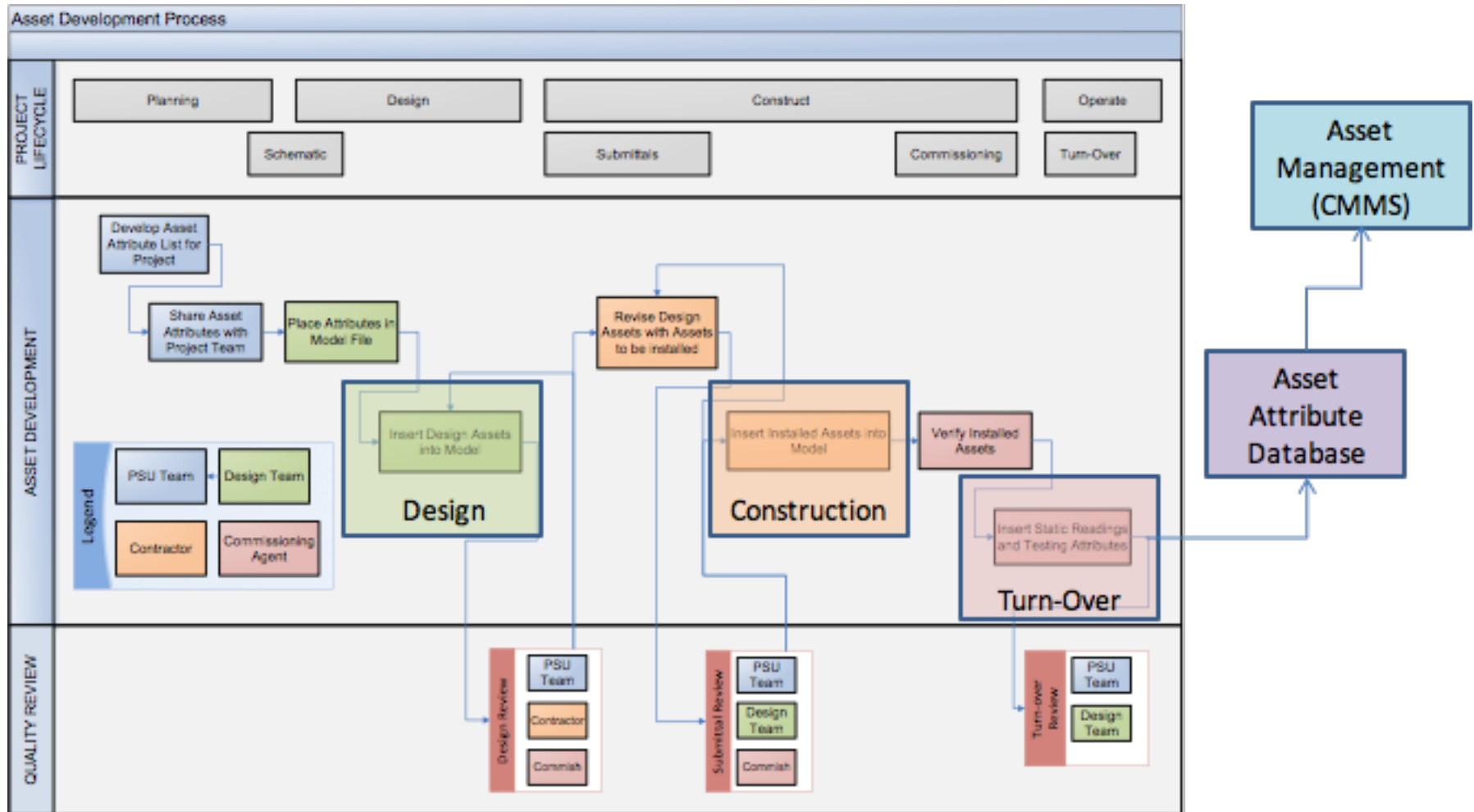


Campus

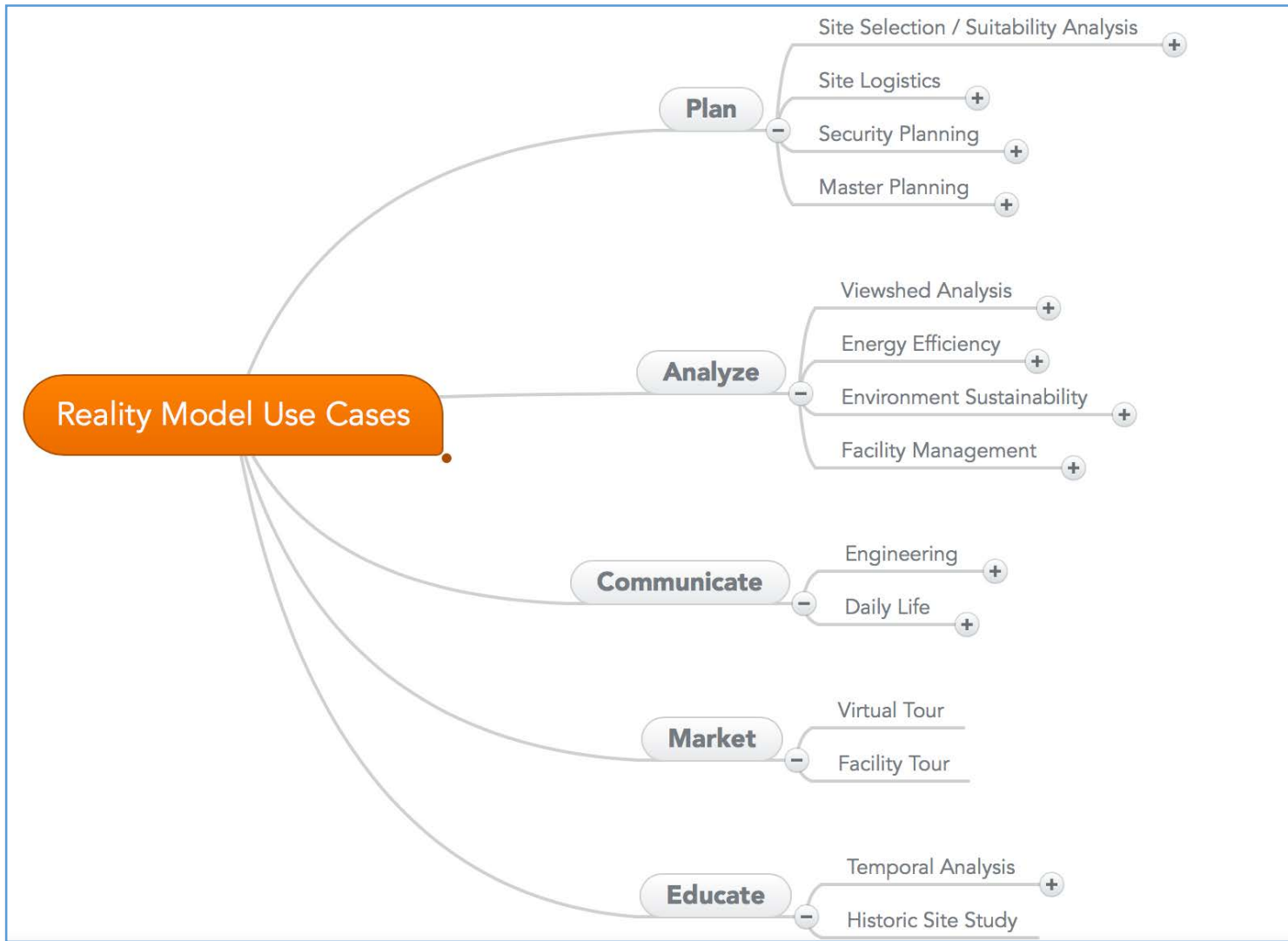


- 947 Buildings
- 20.1 million ft²
(2 million m²)
- 79 Acres of roof
- 65% of buildings
over 25 years old

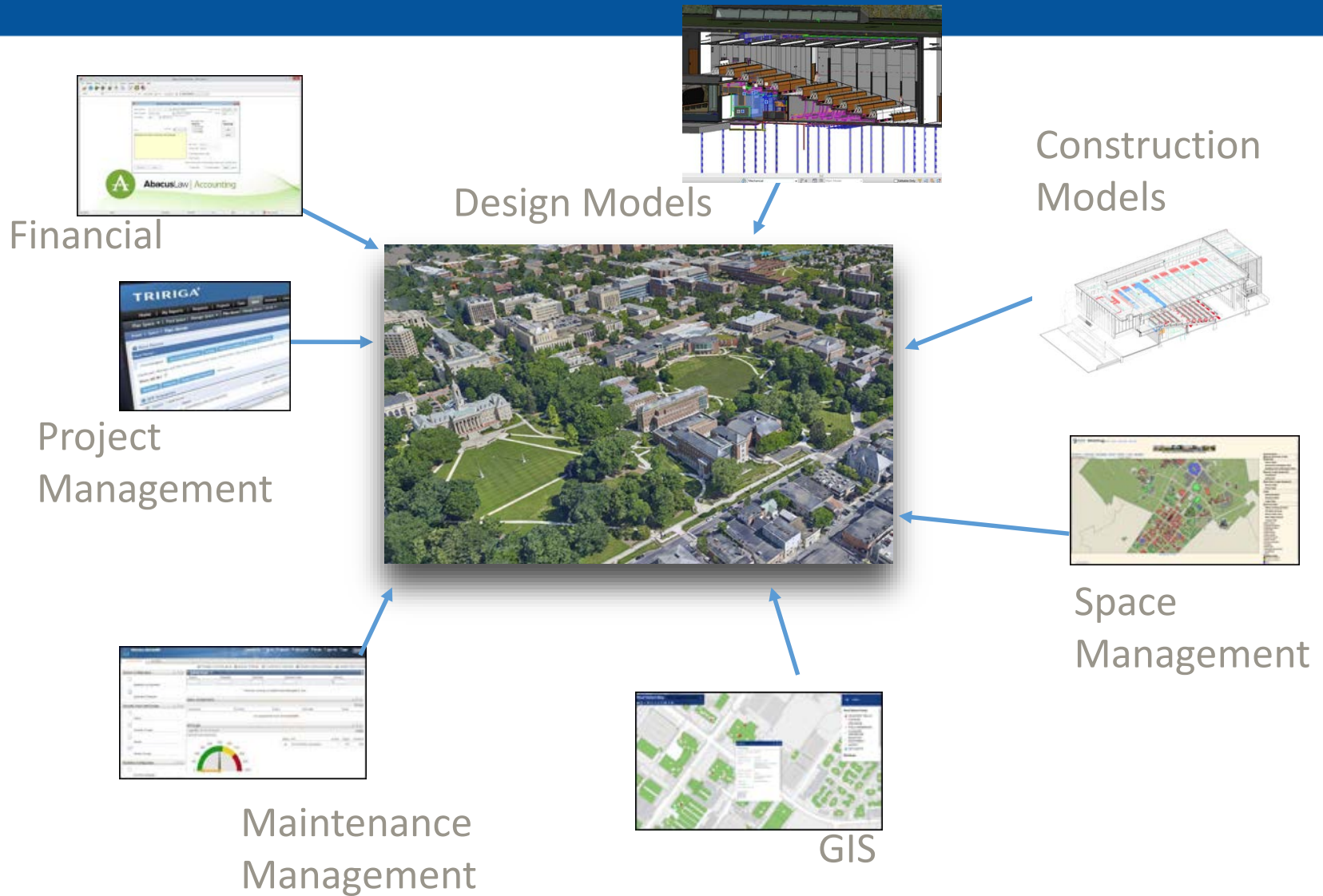
Leveraging Building Information Modeling



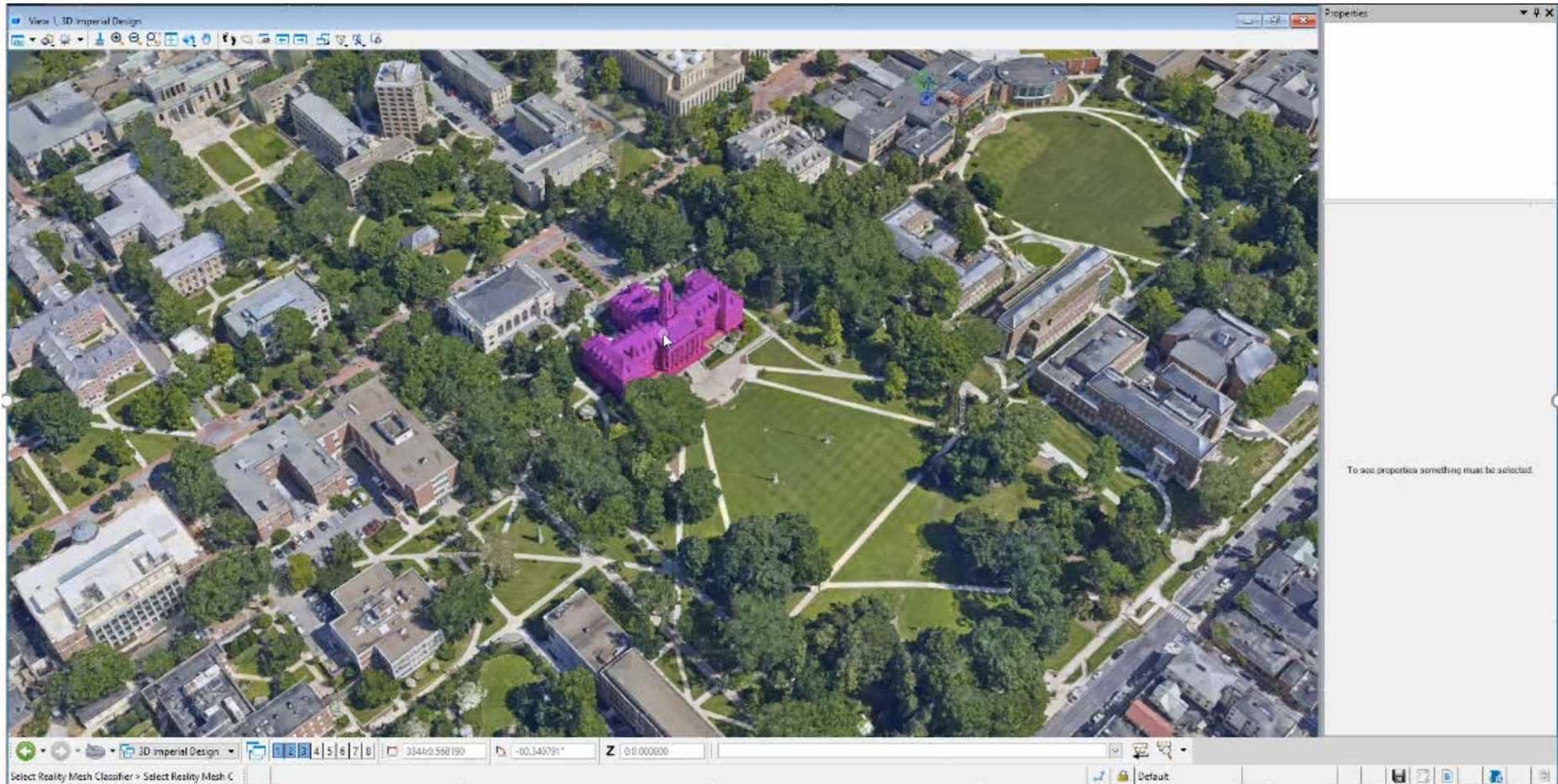
Goal – A Virtual Campus



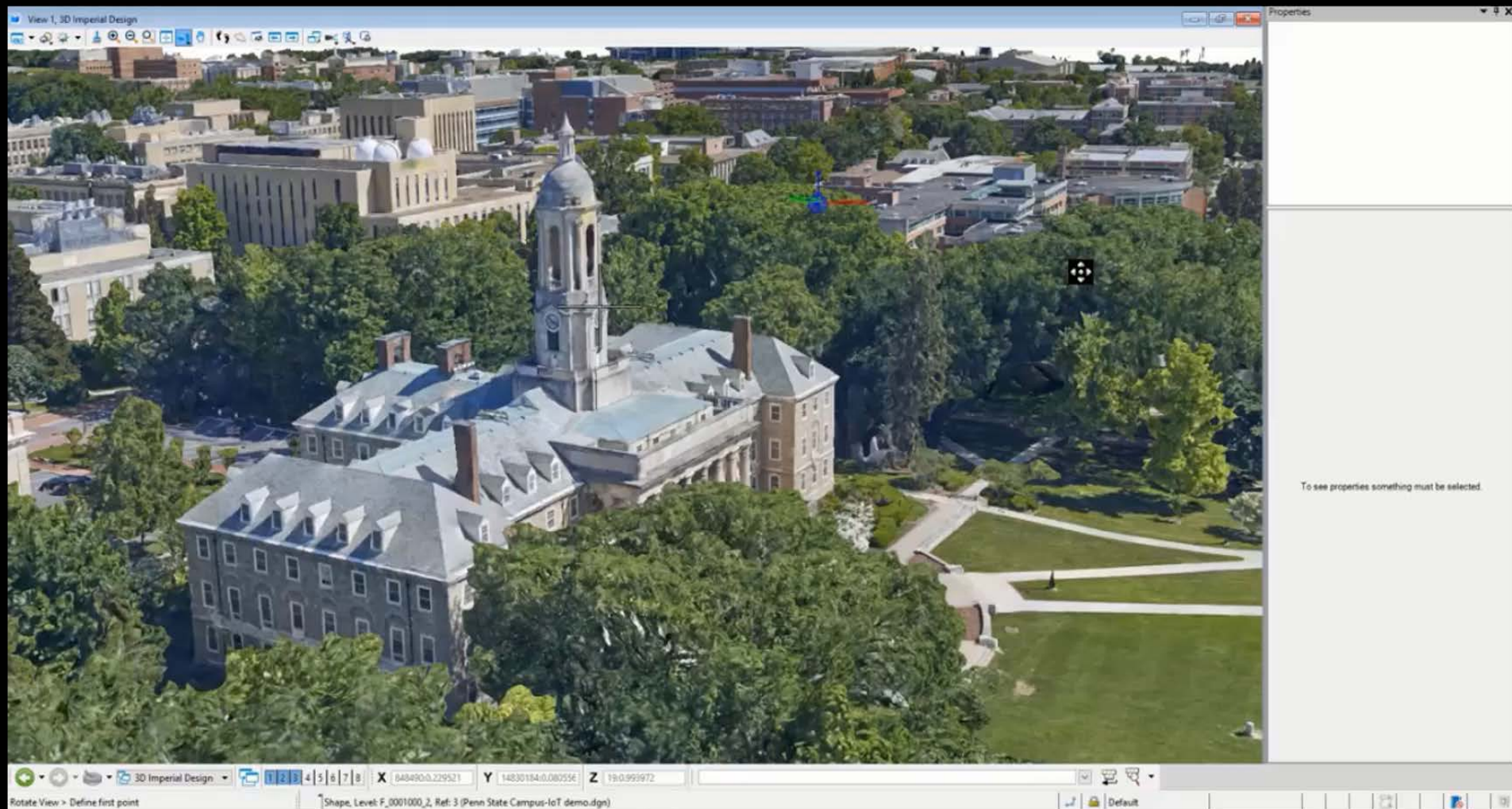
Integrating BIM, GIS, and Enterprise Data



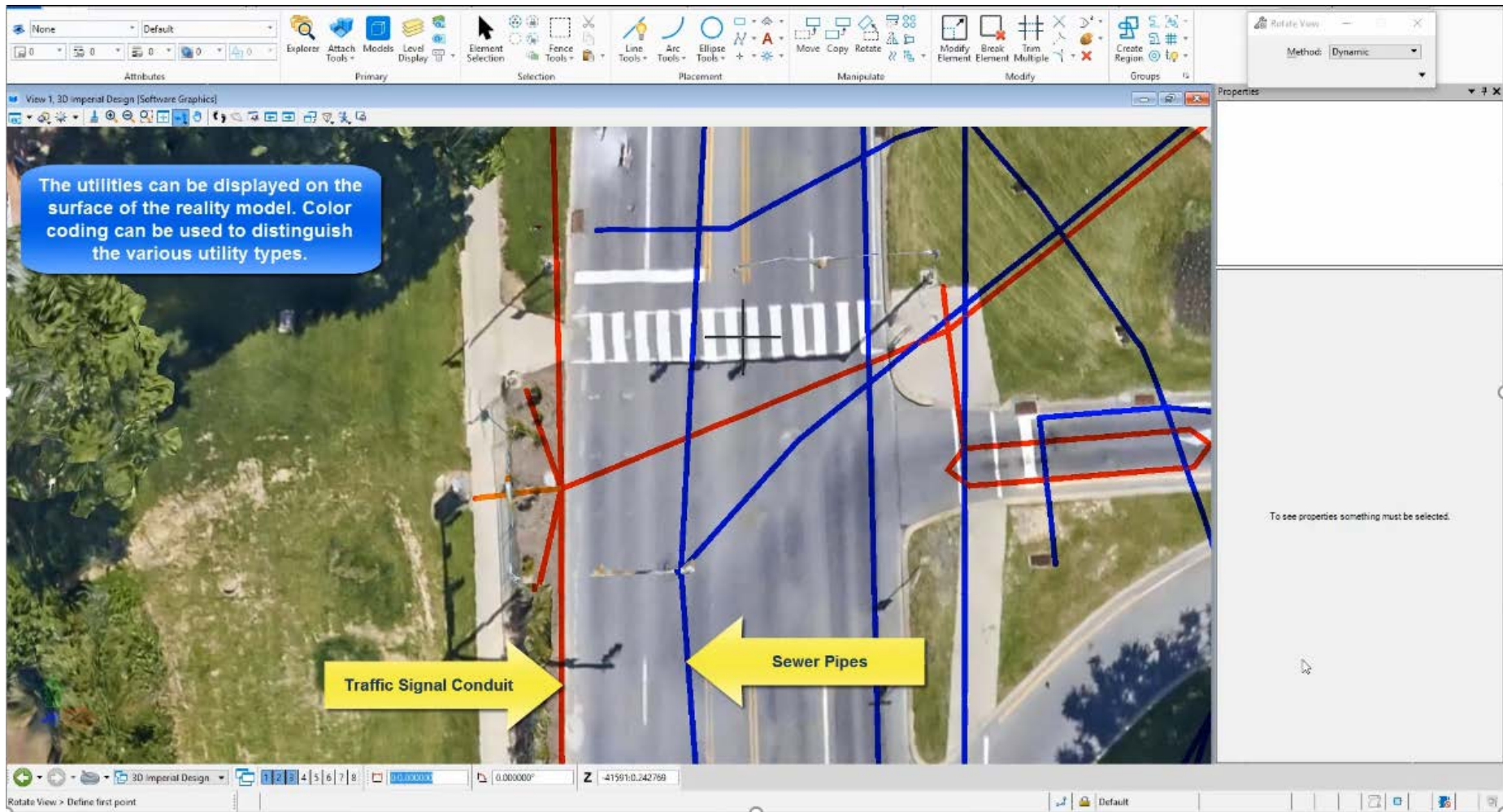
Modeling the Campus



Visualize Space Utilization



Virtual Underground Utilities



Conclusions

- Now possible to capture a 3-D model of a building, community or campus through photogrammetry
- Integrating 3-D with BIM, GIS, and enterprise data allows you to create virtual campus
- Model is then interactive and up to date
- Not just limited to BIM or individual buildings
- Powerful tool for building owners

QUESTIONS?

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