

Facility Datafication: Maximizing the Value of Your Building Portfolio with Revit

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Hi! WE ARE
DAVE &
COLLEEN

Class Summary

Facility Datafication: Maximizing the Value of Your Building Portfolio with Revit Autodesk University

This class will discuss the facility datafication to help owners generate the data they need to optimally manage their buildings. By aligning information technology with operational processes and advanced Revit software techniques, owners and operators are enabled to effectively communicate and collaborate through a model-based Building Information Solution.

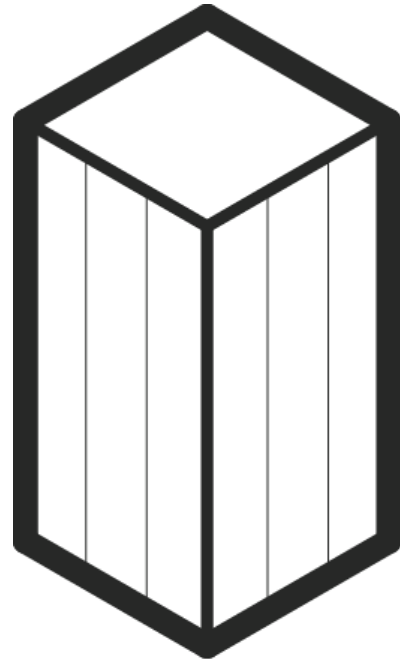
Key Learning Objectives

Facility Datafication: Maximizing the Value of Your Building Portfolio with Revit

Autodesk University

At the end of this class, you will be able to:

- Describe effective practices for developing a Building Information strategy for facility owners and operators
- Learn from examples of the facility datafication process currently being implemented on existing building portfolios
- Outline the facility datafication process
- Use Revit to visualize and integrate owner-defined BIM uses



bldgs

=



data



If Gap needs to refinish all of the flooring in the North East, do they know what material and how much?


GAP





If Chipotle needs to deploy a new sneeze guard standard, do they know how much glass to buy?



A photograph of a Starbucks store interior, featuring shelves stocked with coffee products, a counter, and a small round table with stools in the foreground. The entire image is overlaid with a semi-transparent blue filter.

If Starbucks designs a new cash wrap, how much change will it present to existing stores?





**Mall leases change daily
across a whole portfolio, how
does Westfield manage lease
compliance across millions of
square feet?**

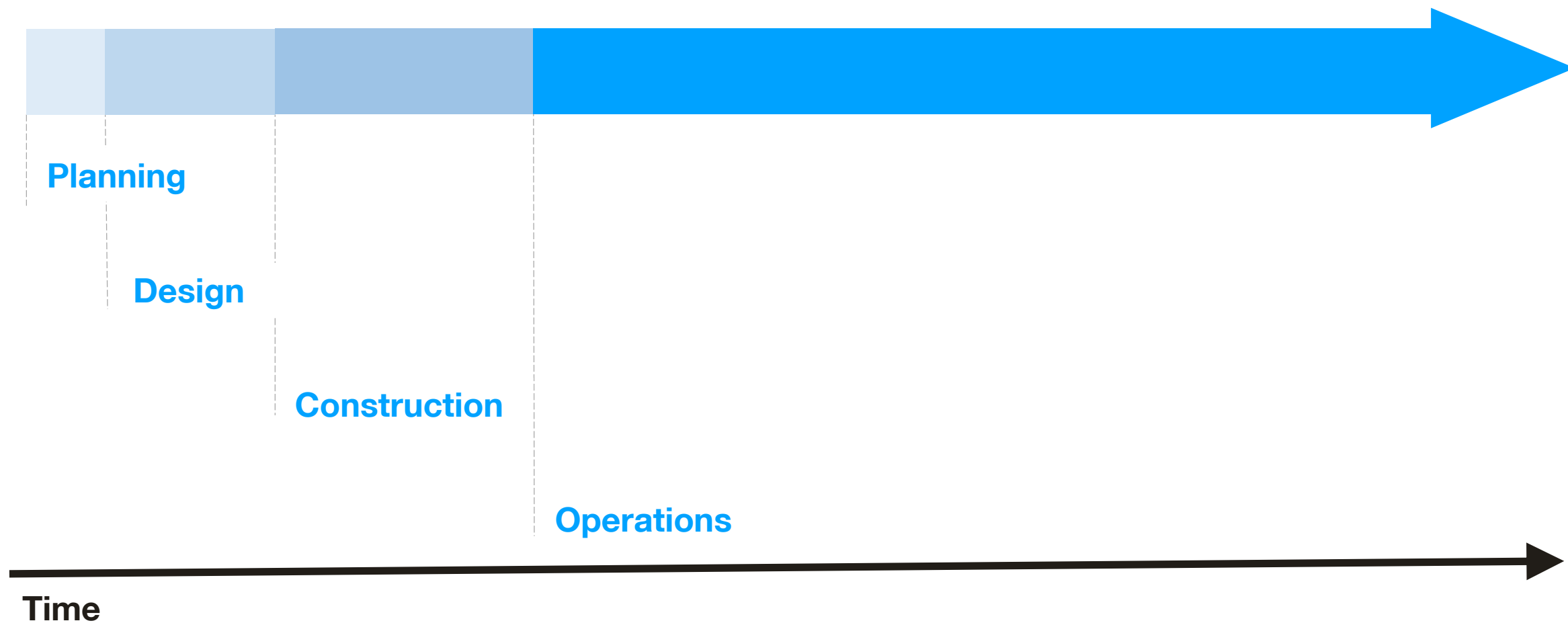
**We do NOT work
with any of these
companies. But if I
had to guess...**

**“It’s probably in a
spreadsheet
somewhere.”**

Building Information Timeline

Presumably building data flows from phase to phase

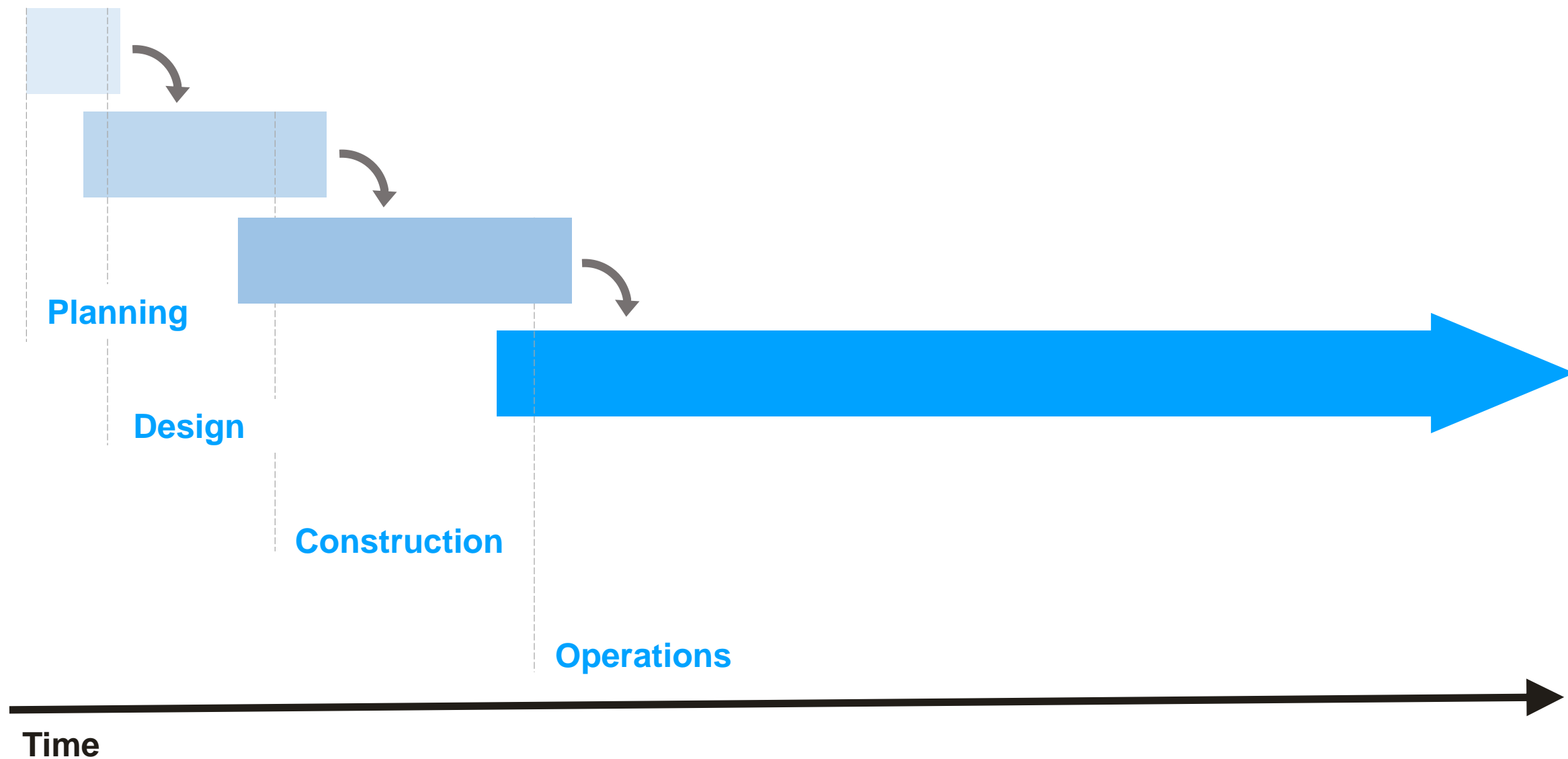
BLDGS = DATA



Building Information Timeline

...or, gets handed off cleanly from phase to phase

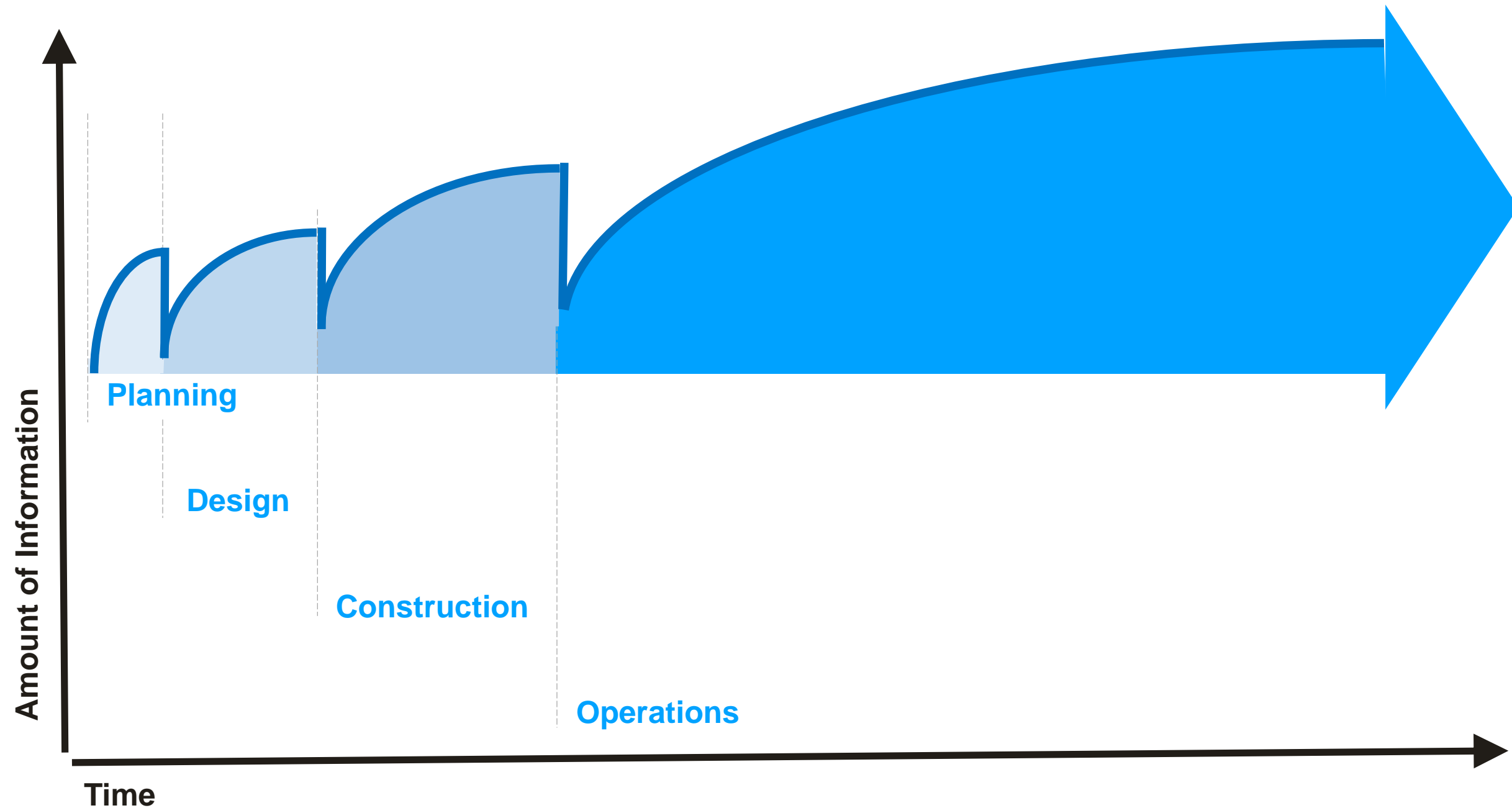
BLDGS = DATA



Building Information Timeline

The truth is, there is a lot of rework, restarts, and data loss

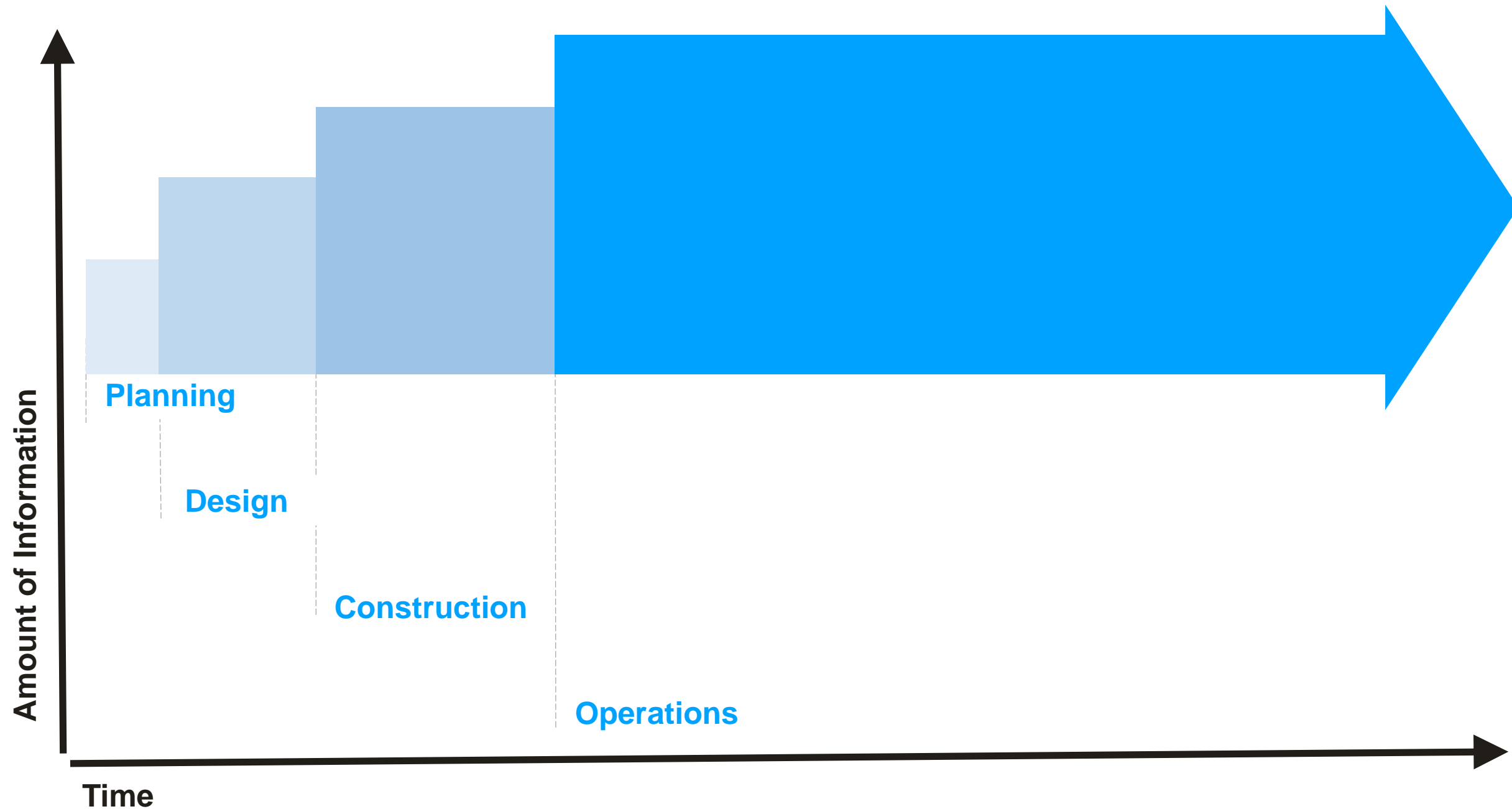
BLDGS = DATA



Building Information Flow

AND...Each phase results in more and more data

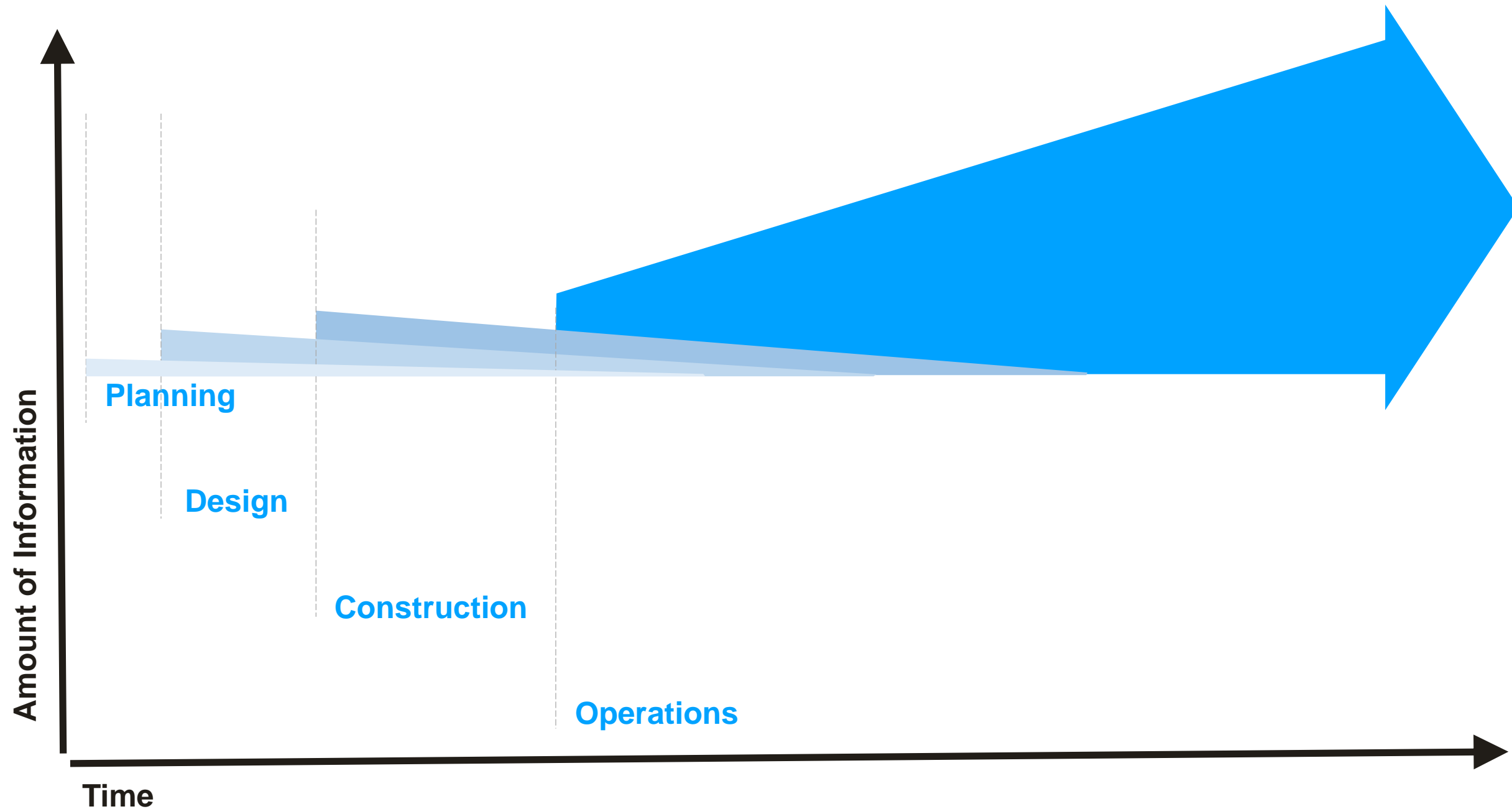
BLDGS = DATA



Building Information Flow

Planning, Design, & Construction data do not get transferred

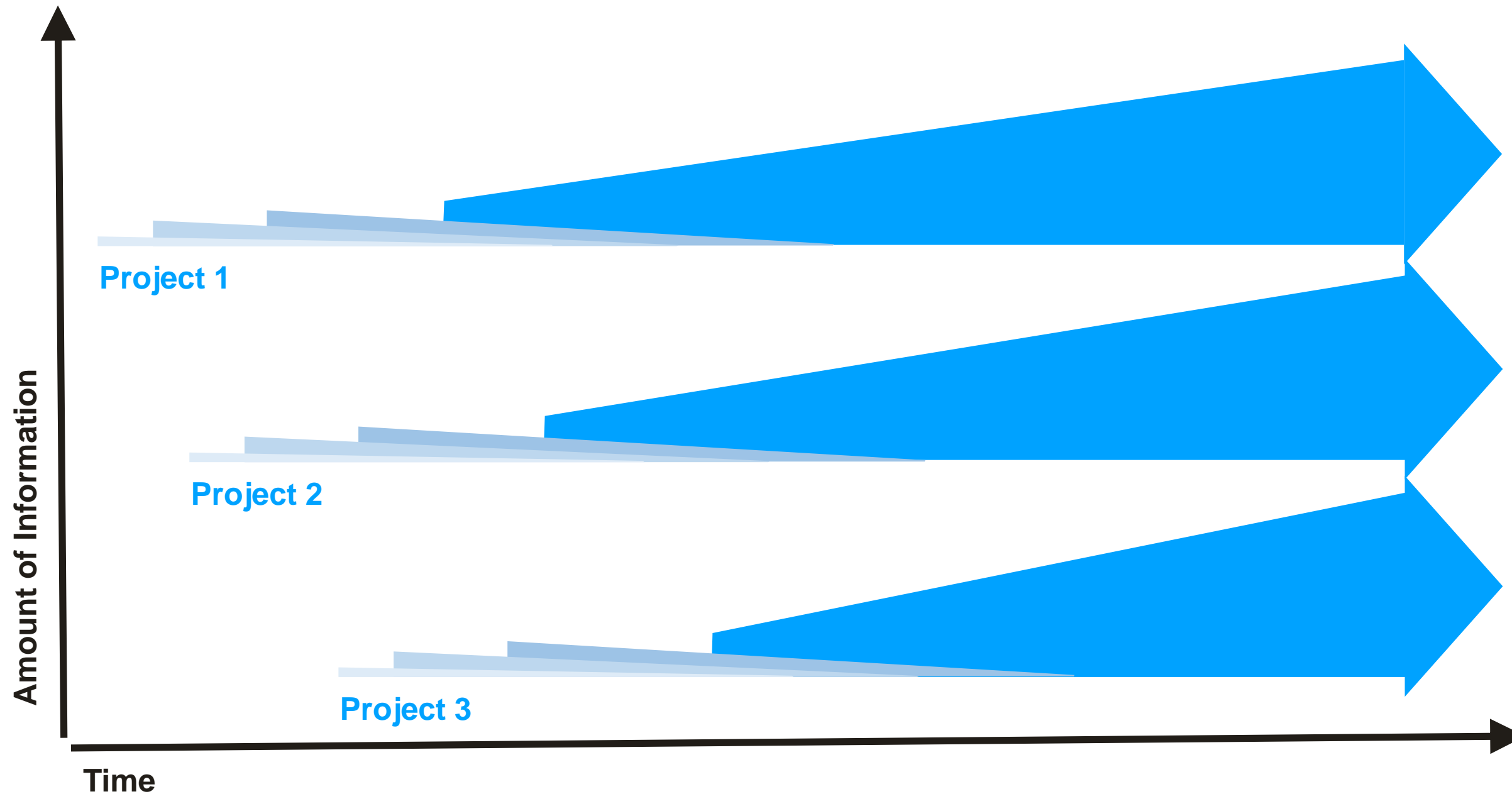
BLDGS = DATA



Building Information Flow

More projects, more data...

BLDGS = DATA



**This is NOT a
technology problem...**

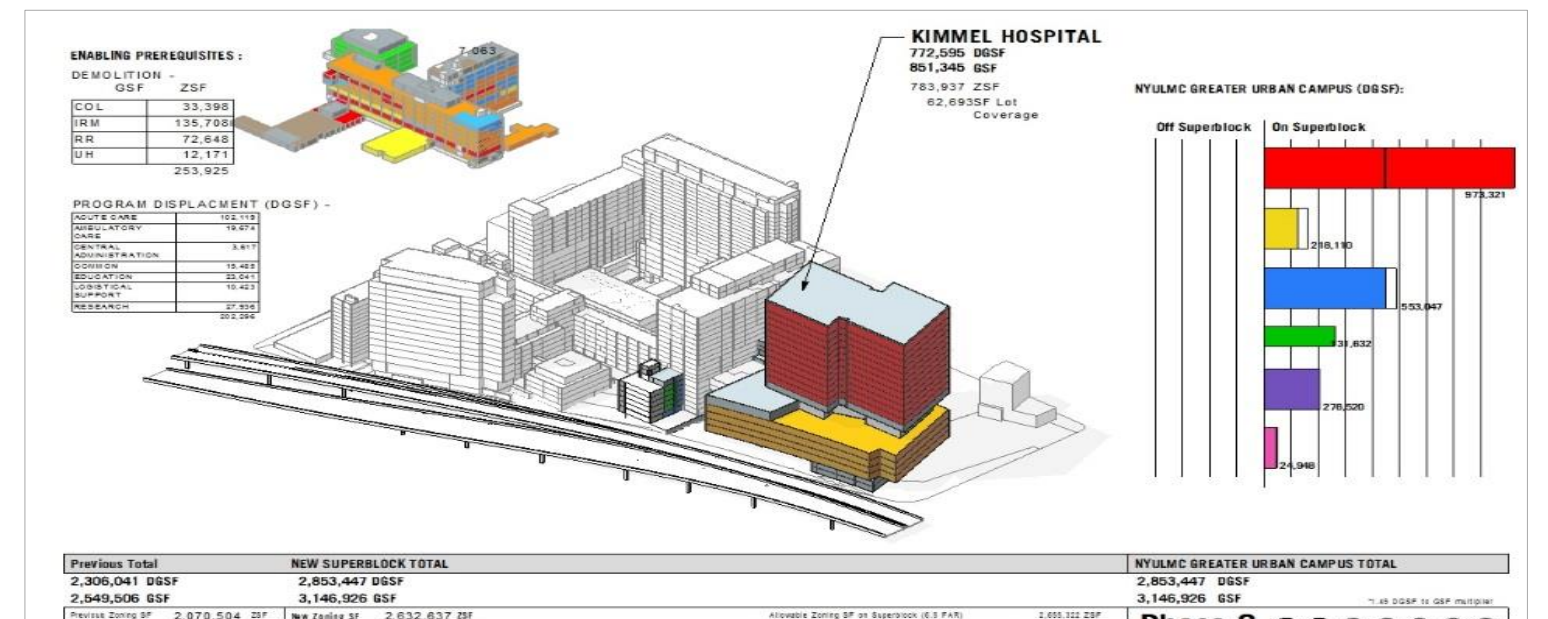
This is a
Building Information
Management
problem

By leveraging Building Information

**Owners can better Plan,
Design, Construct and
Operate great buildings
for people to do great things**

***Here are some ideas on
how to make this happen...***

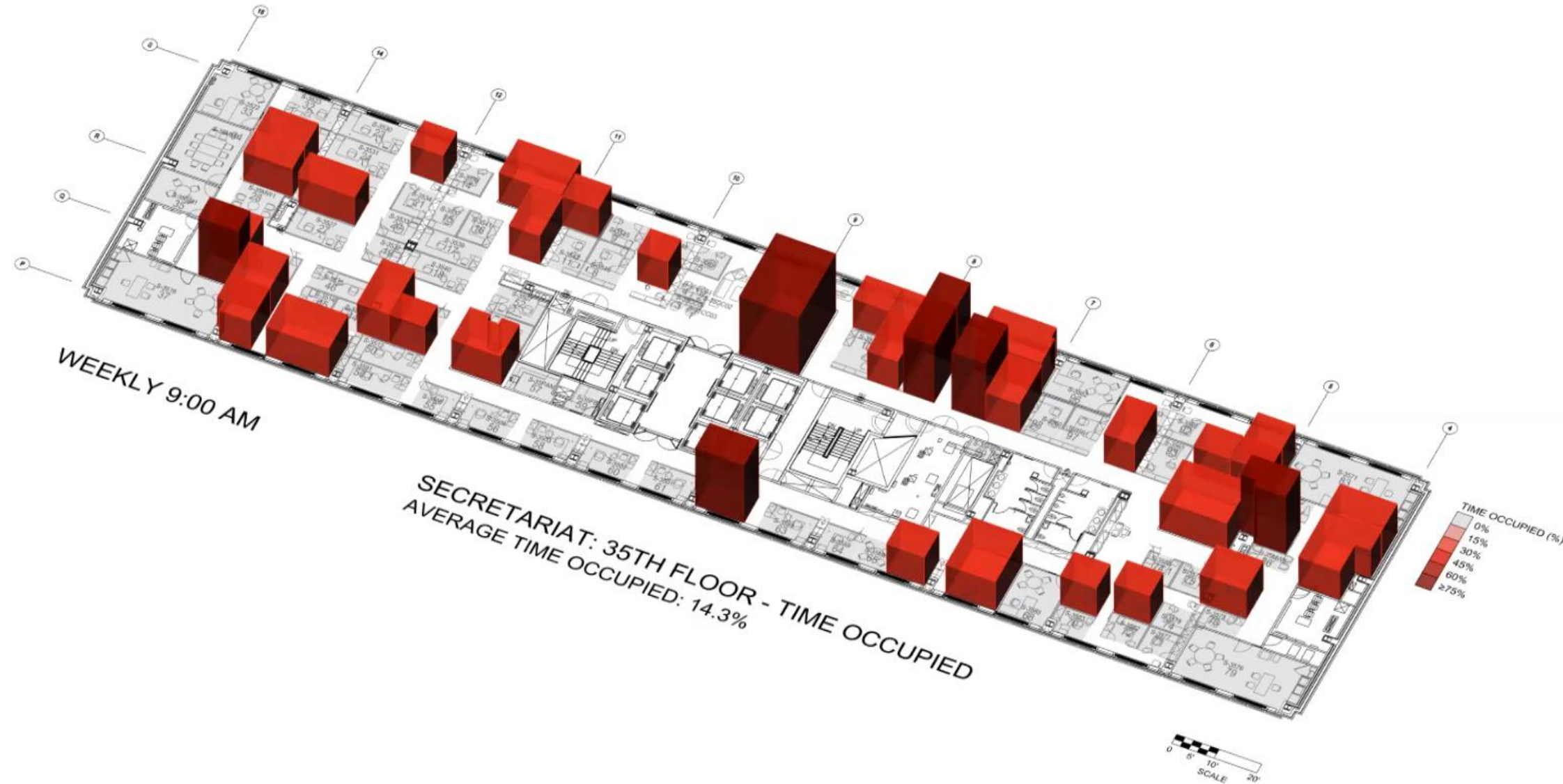
BLDGS = DATA



Data for Master Planning

Occupancy & Usage Data Visualization

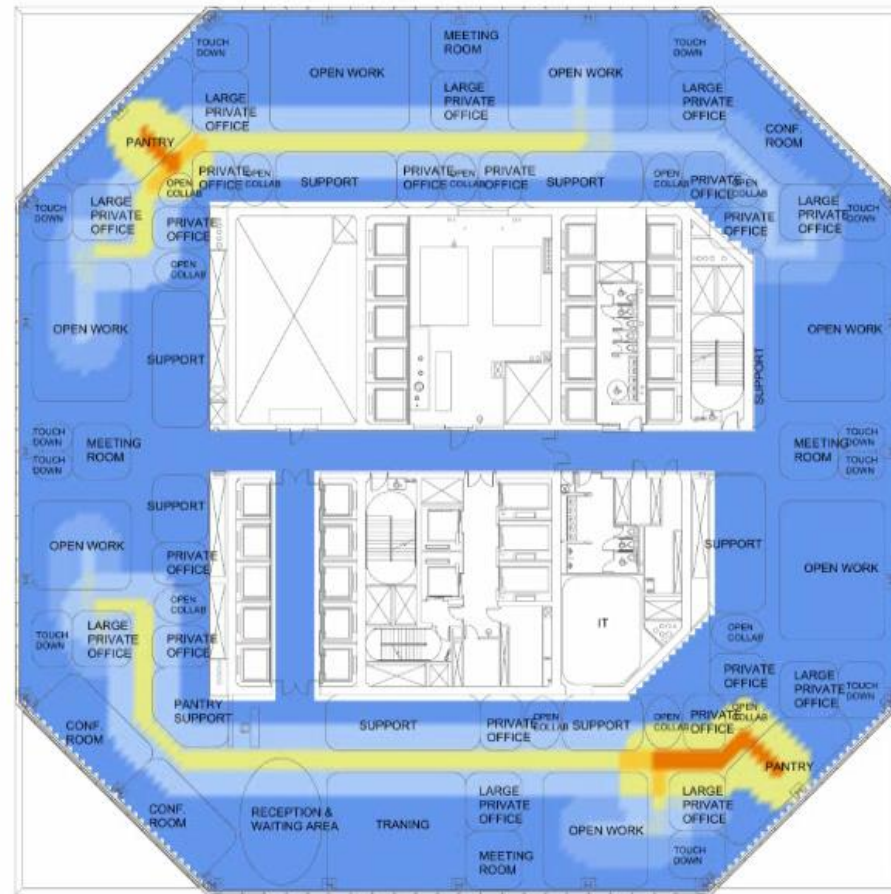
BLDGS = DATA



Data for Predictive Planning

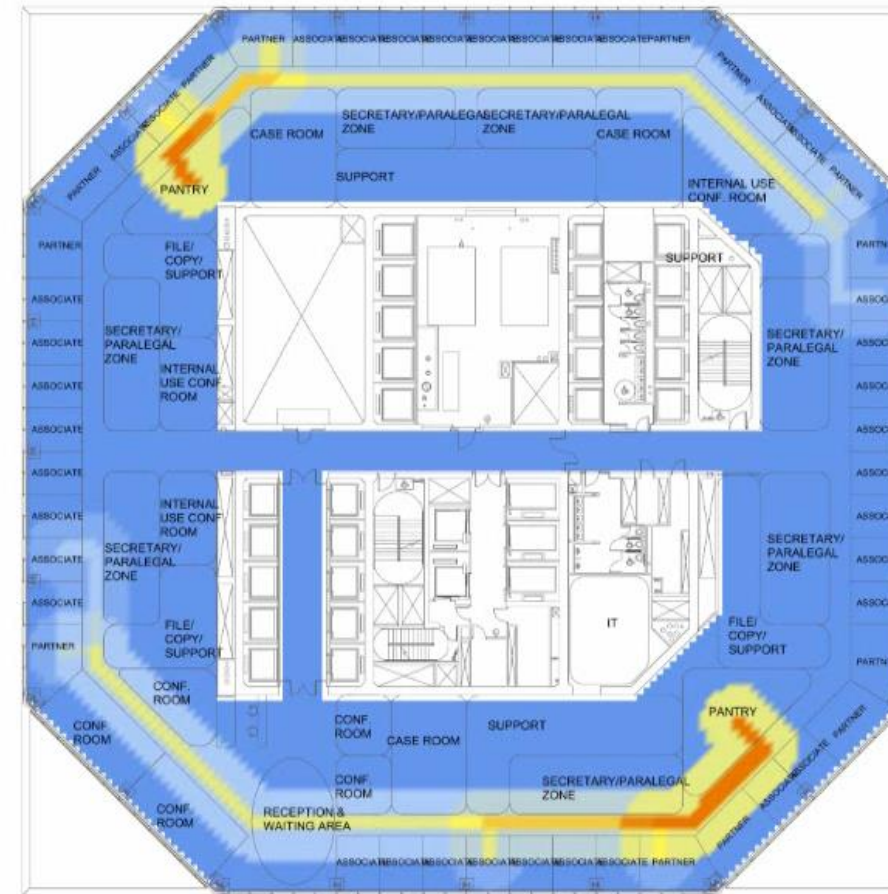
User Path & Interaction Analysis

BLDGS = DATA



TEST FIT: BEST PRACTICE
BUBBLE DIAGRAM

9:00

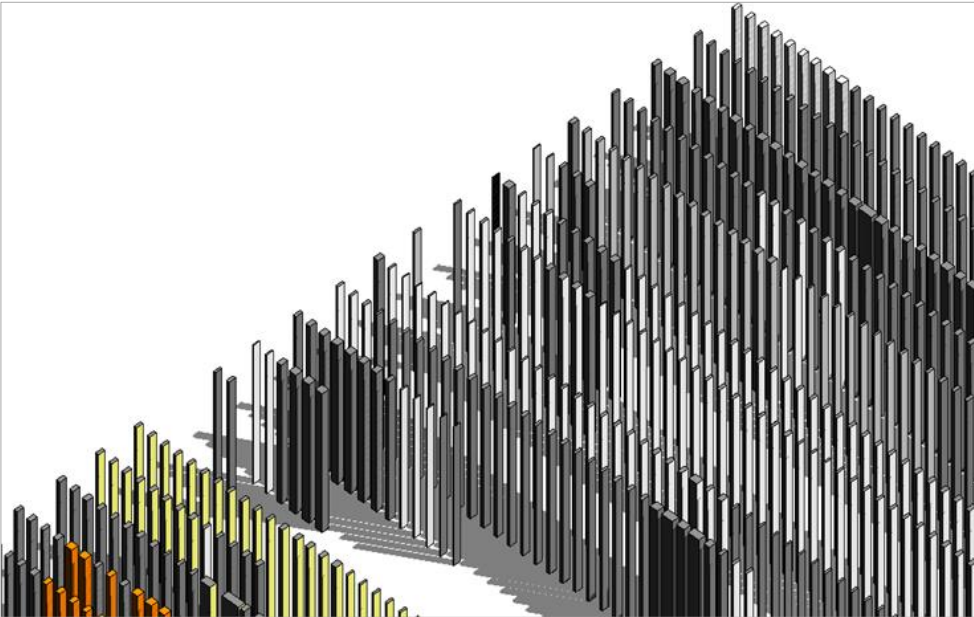
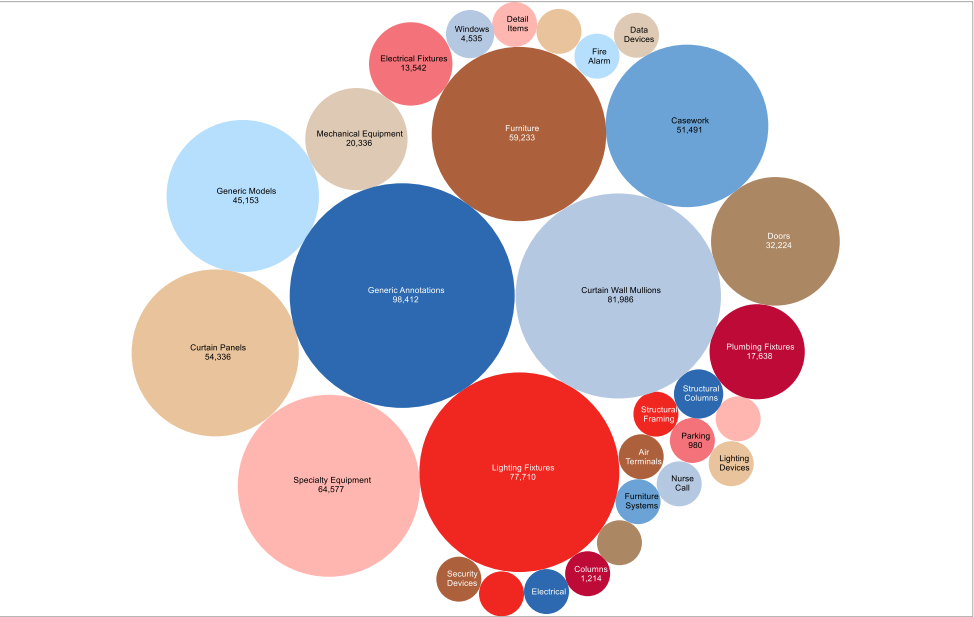
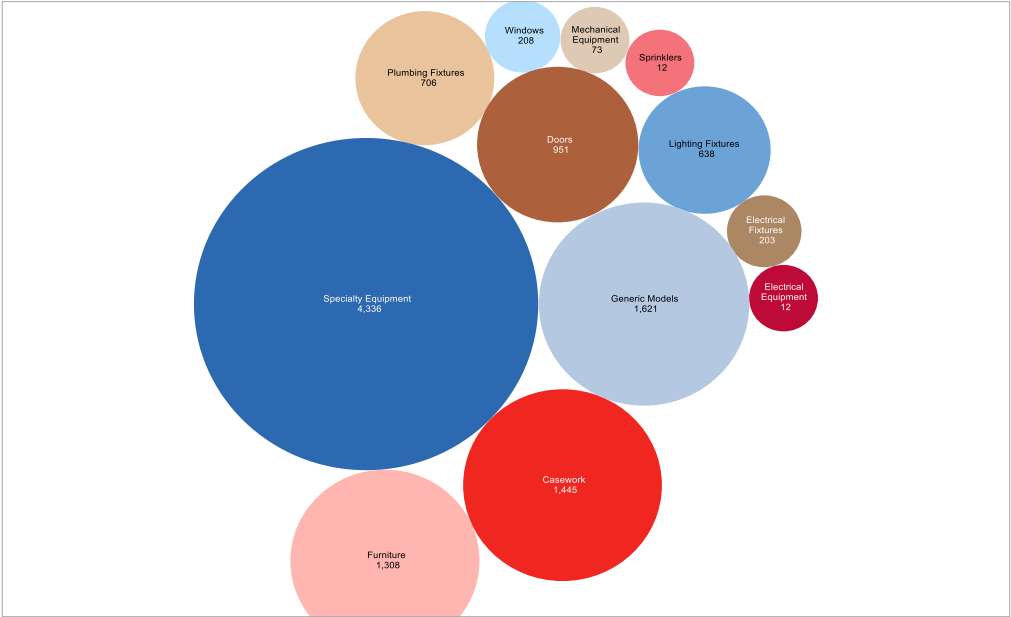
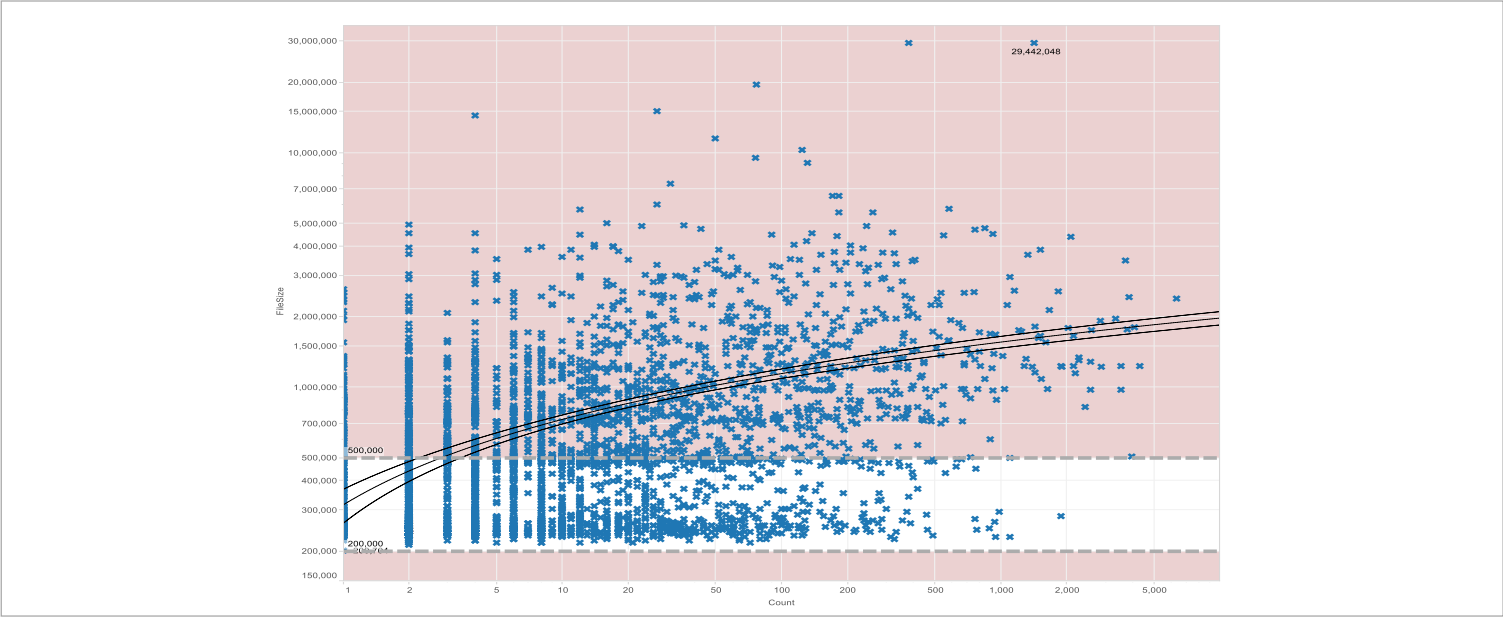
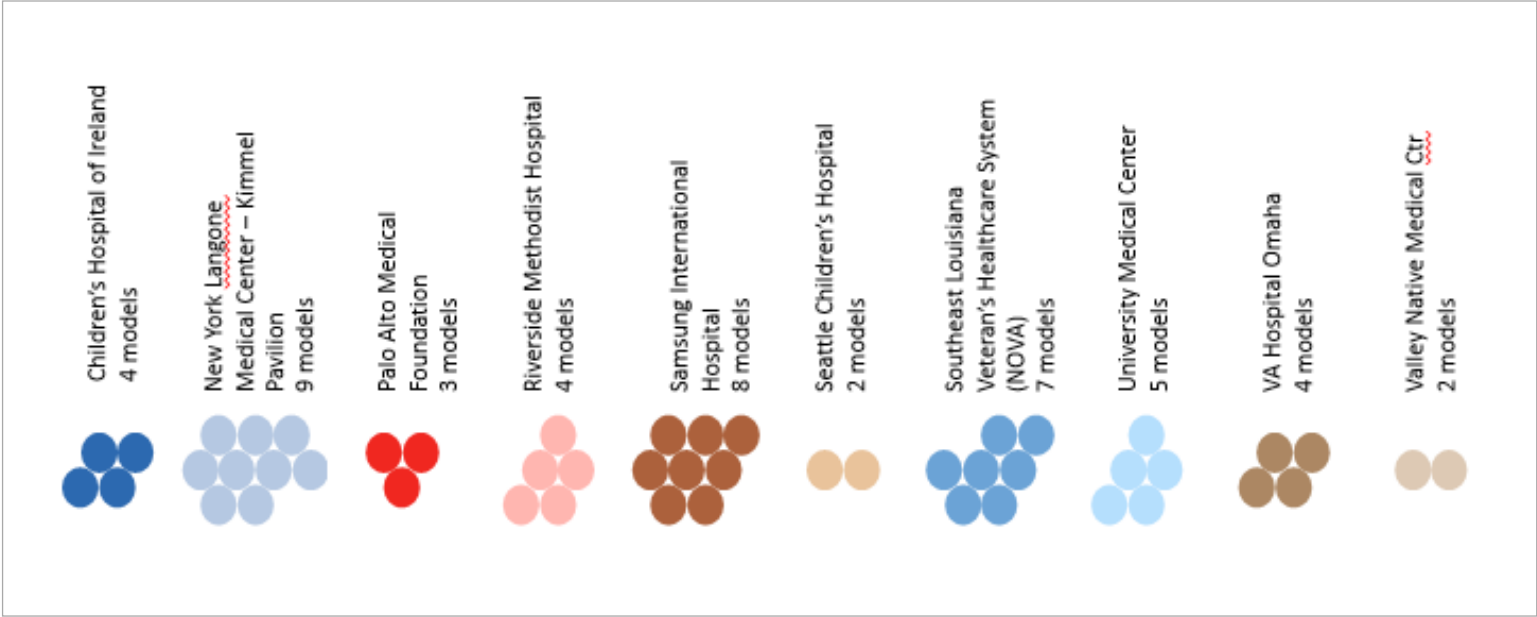


TEST FIT: LAW
BUBBLE DIAGRAM

Data for Knowledge Insight

Content Harvesting

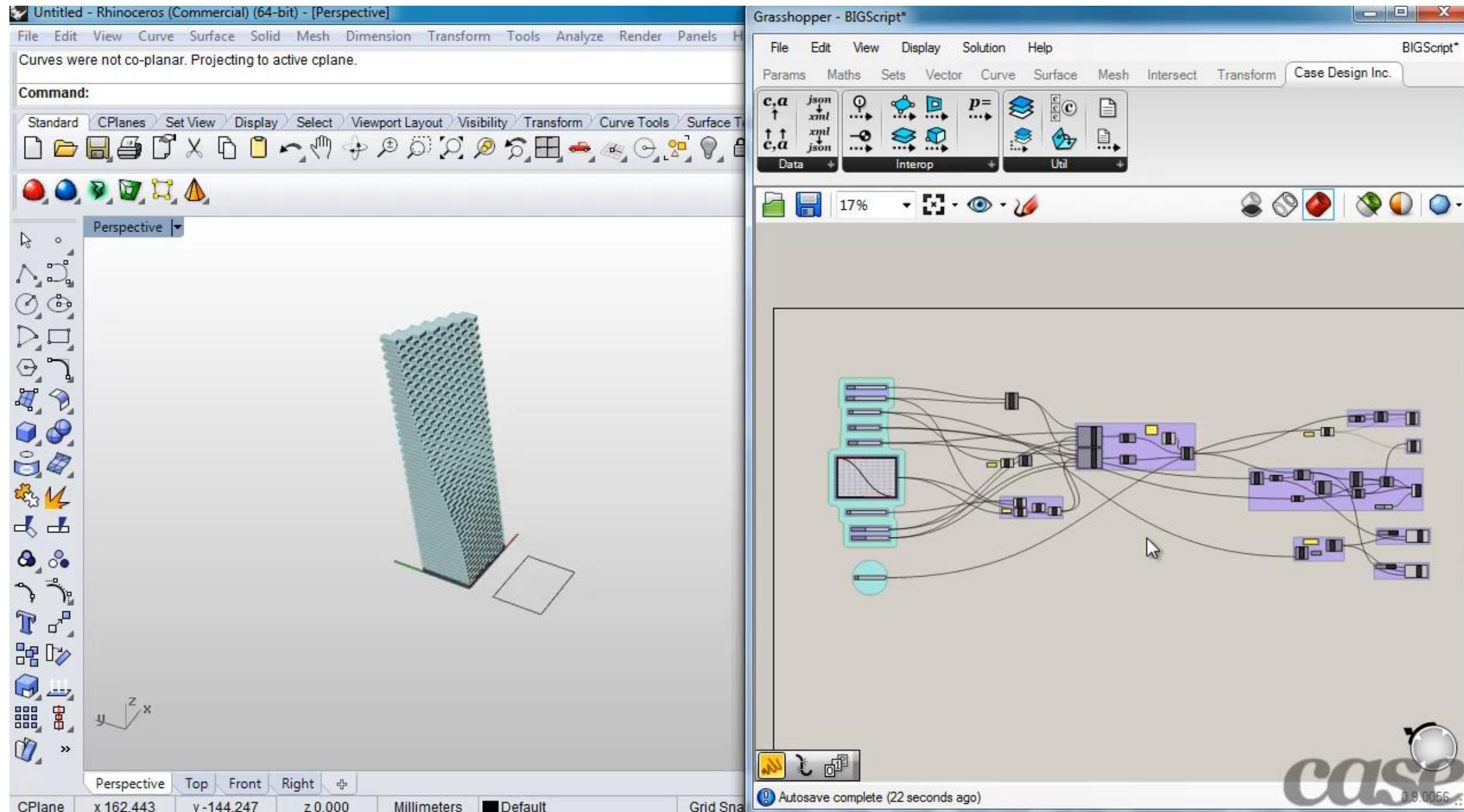
BLDGS = DATA



Data for Design Integration

Design Application Data Translation

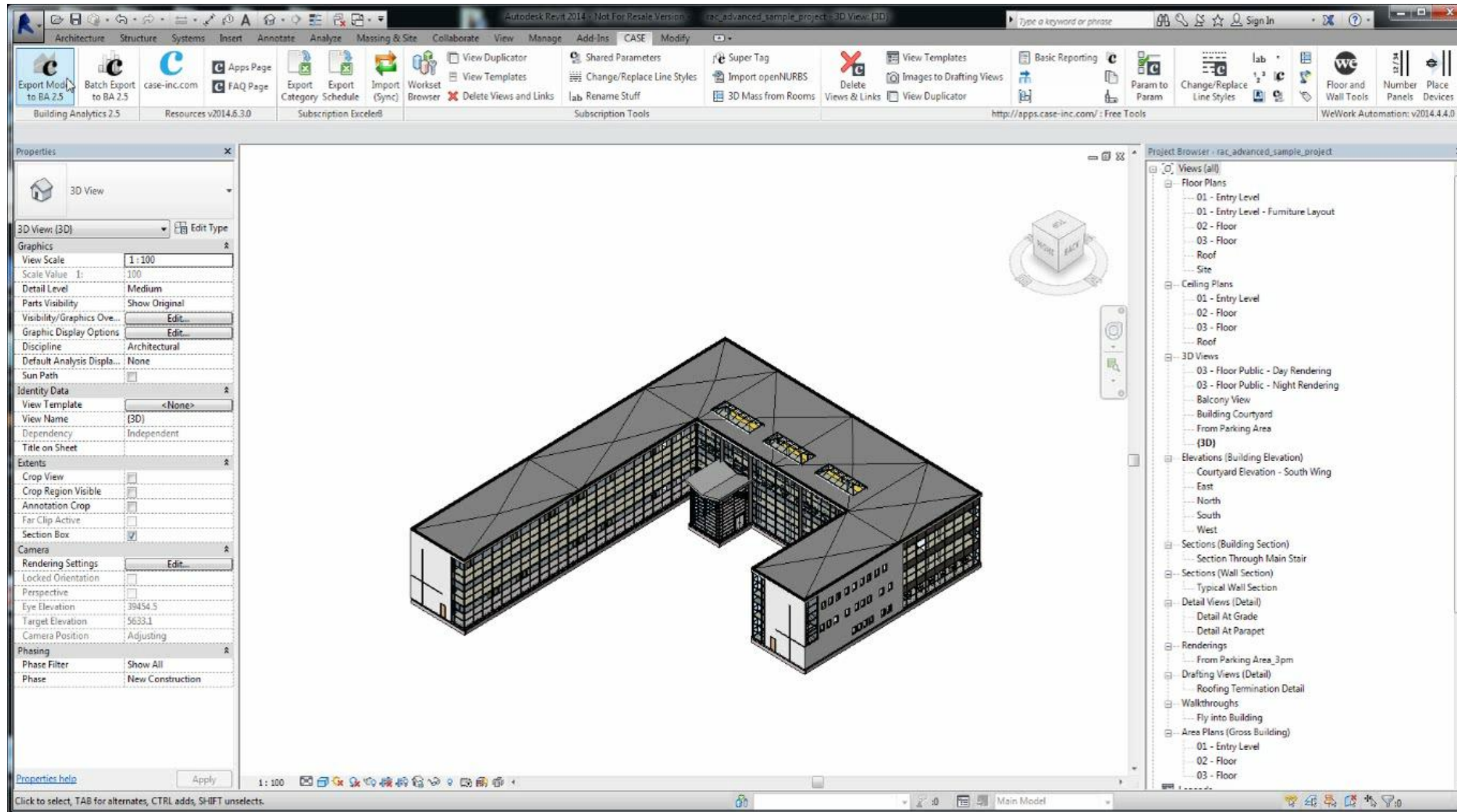
BLDGS = DATA



Data for Delivery

BIM Data Aggregation & Analysis Platform

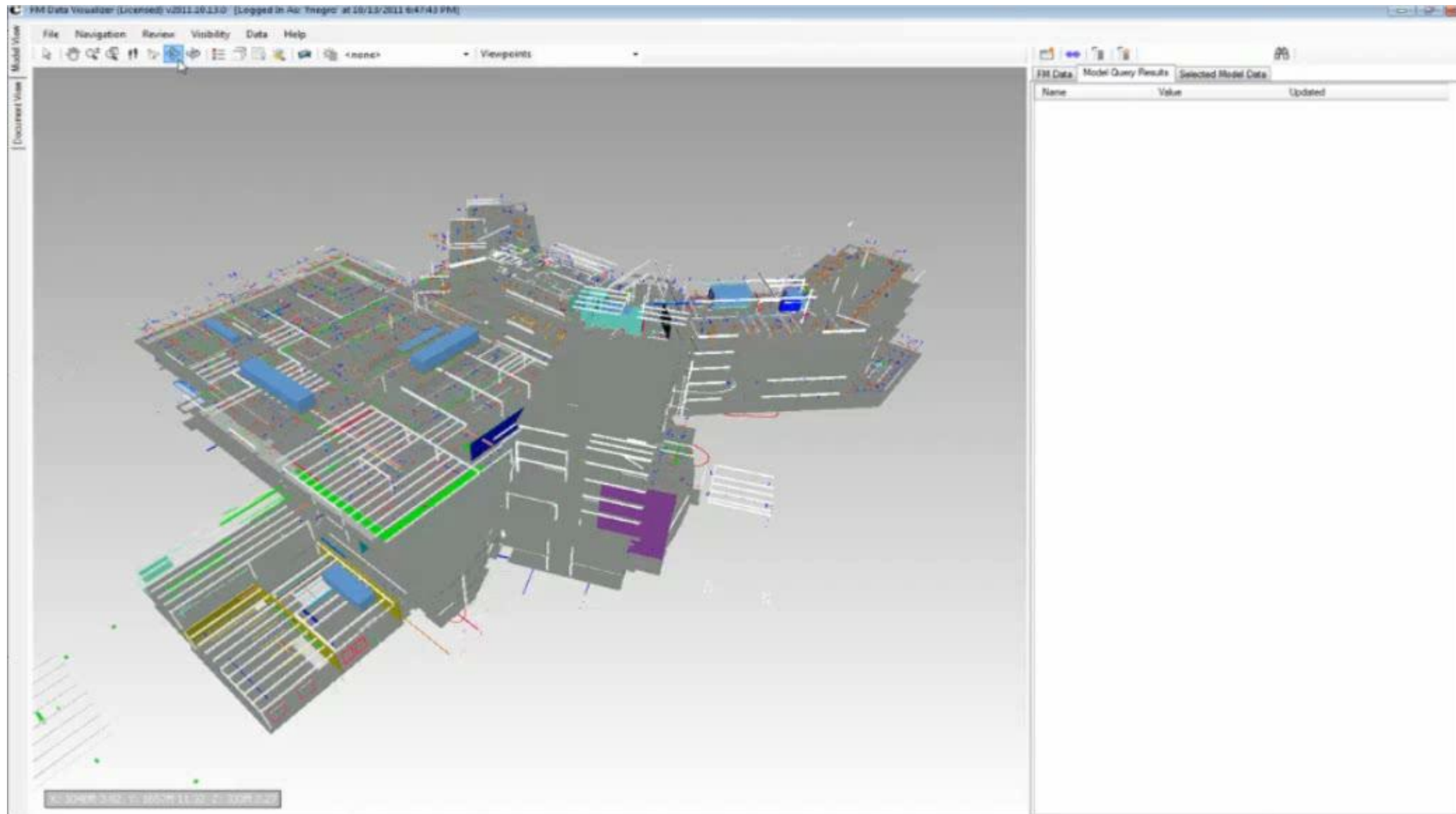
BLDGS = DATA



Data for Operations

BIM-based Asset Tracking & Operations Database

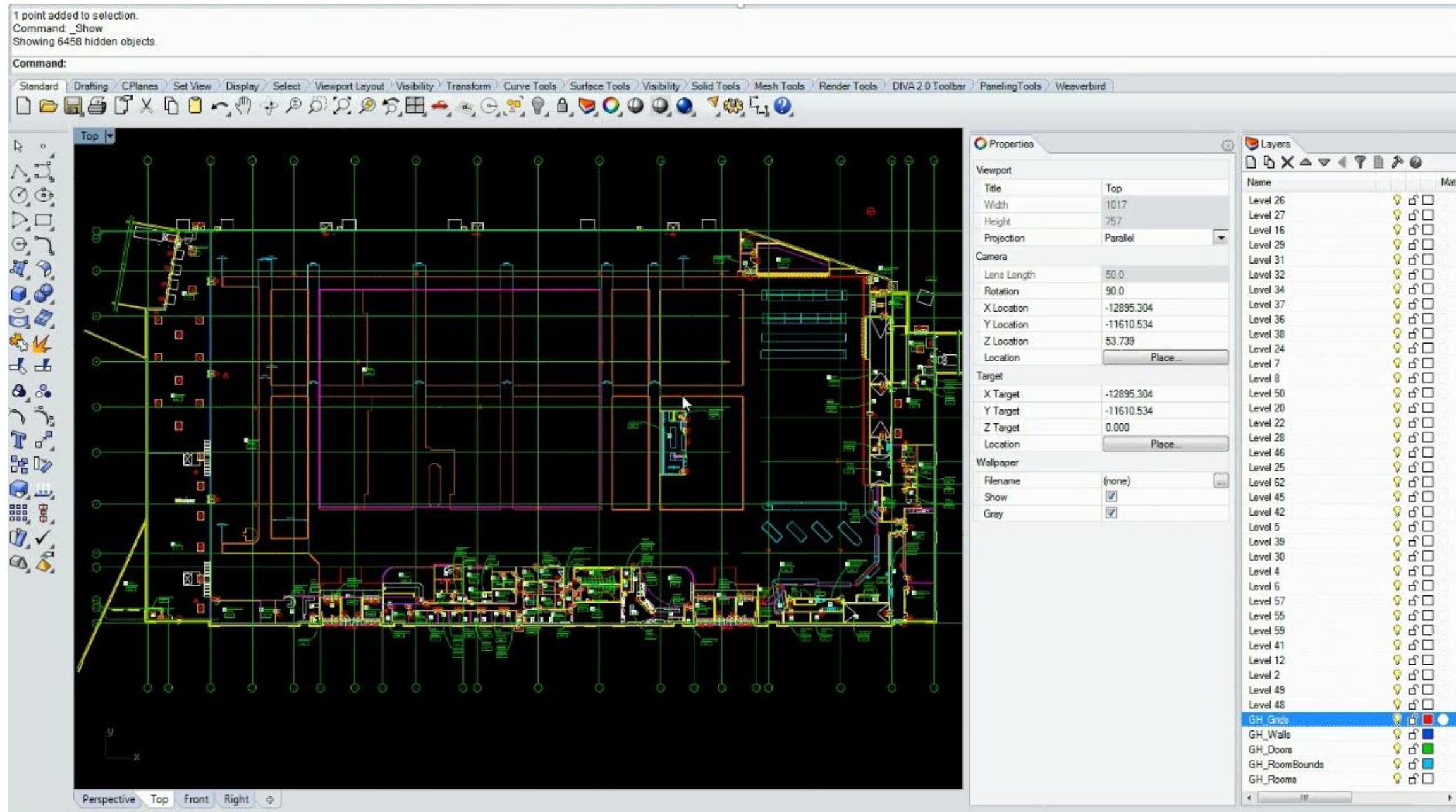
BLDGS = DATA



Data for Existing Buildings

Automate Model Creation from DGN

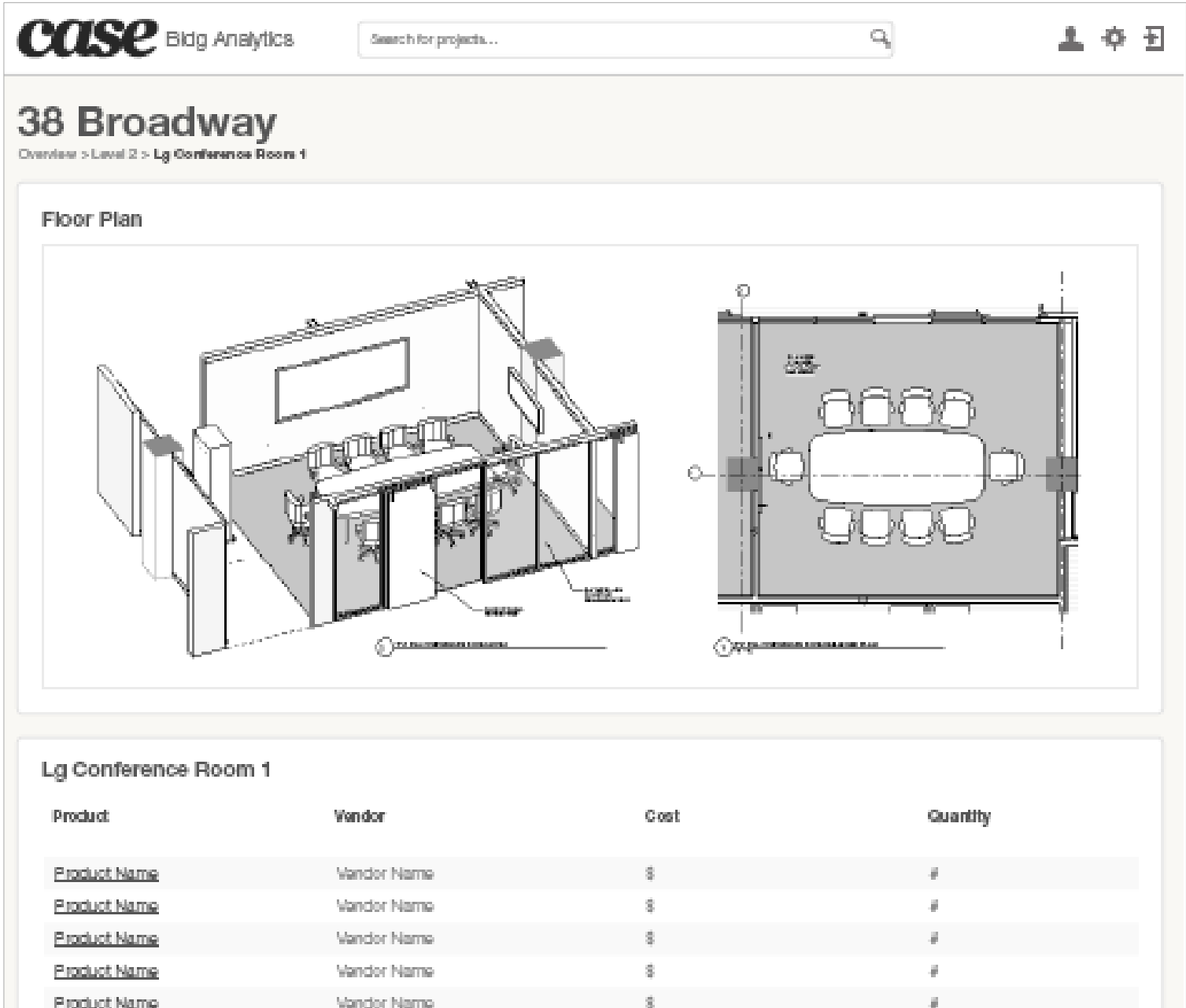
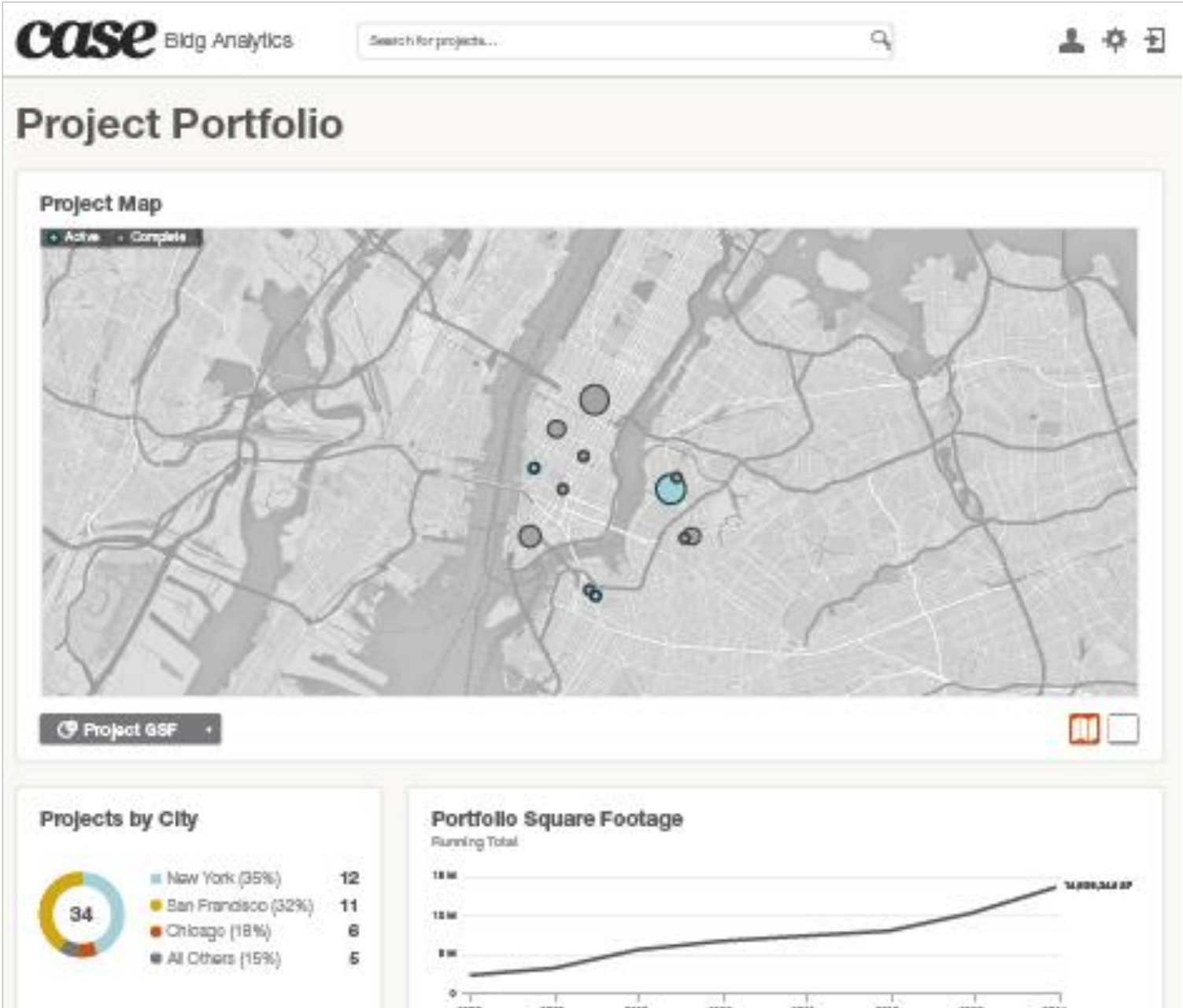
BLDGS = DATA



Data for Portfolio Management

Building Management Tools

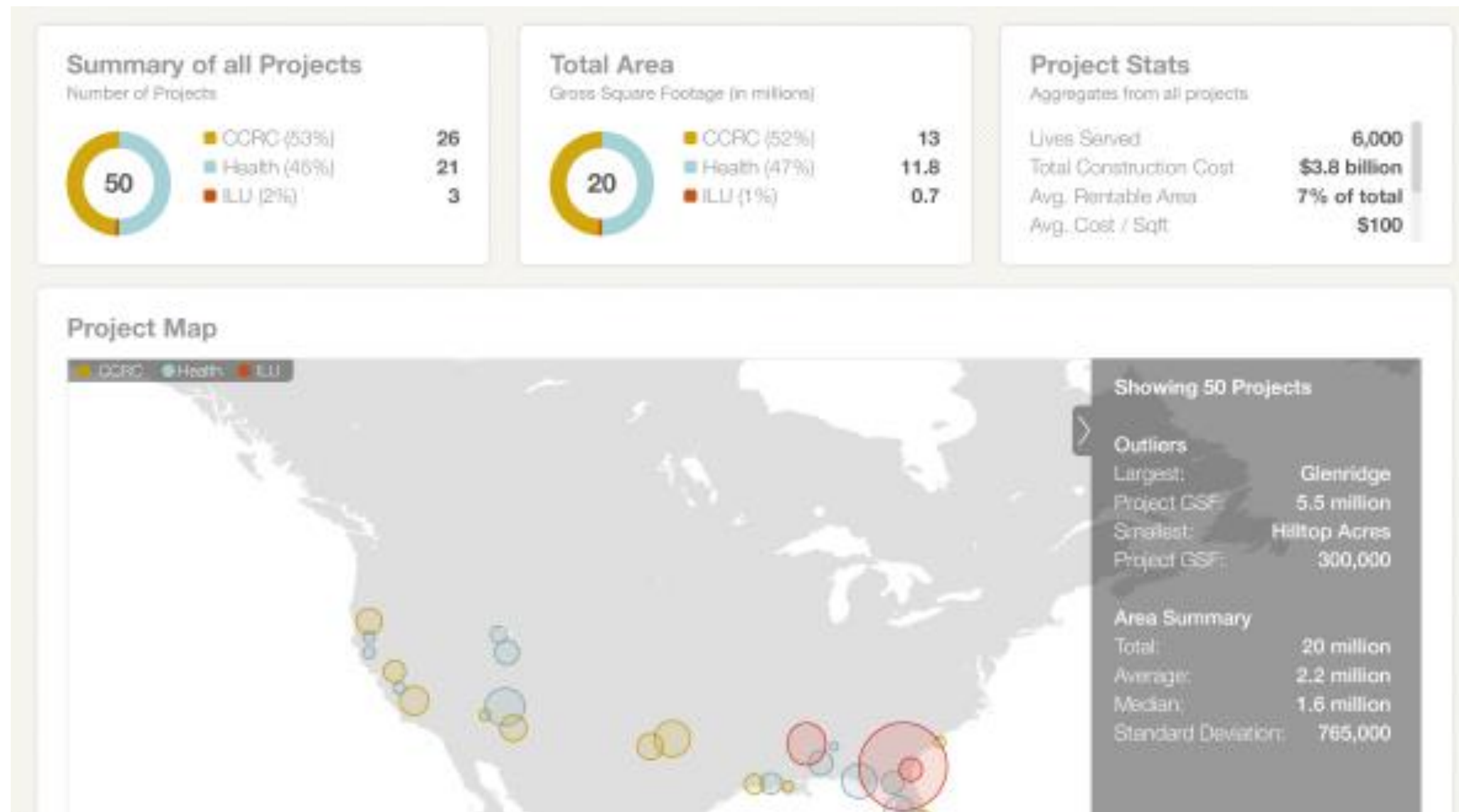
BLDGS = DATA



Data for Business Analysis

Business Intelligence & Project Performance

BLDGS = DATA

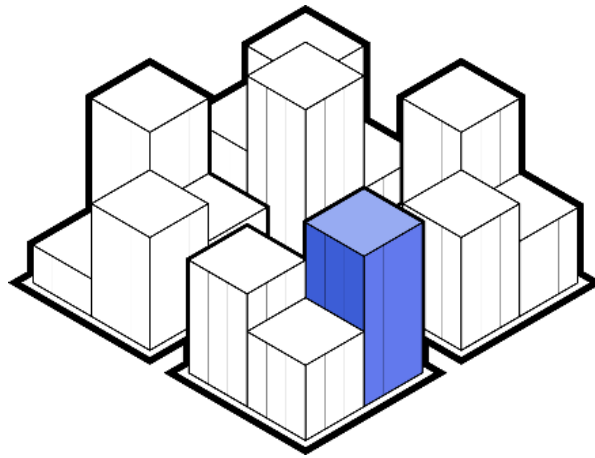


Now, let's do it!

Levels of Building Information

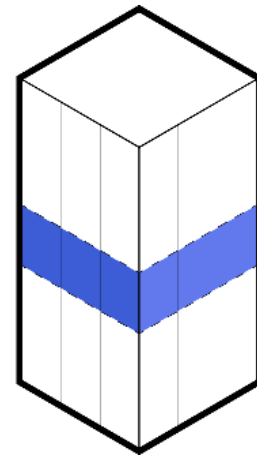
Companies need to be able to navigate all levels of their BI

BLDGS = DATA



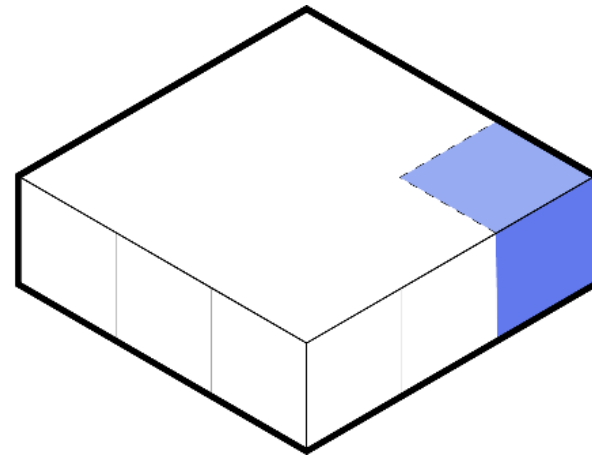
Portfolio

Properties of a
real estate manager
or owner



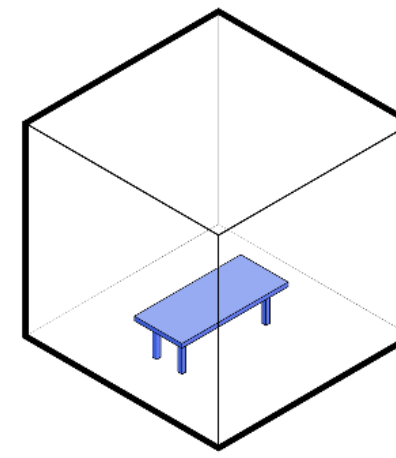
Building

Physical
address for a
single structure



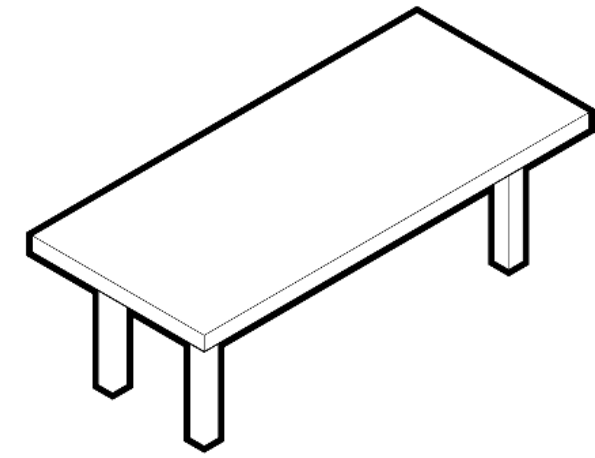
Floor

A single level
within a
building



Space

A volume that
holds business
activity



Object

A physical thing
that sits with in a
building

0 - Site - 3D View: {3D}

Type a keyword or phrase

Sign In

Architecture Structure Systems Insert Annotate Analyze Massing & Site Collaborate View Manage Add-Ins CASE Extensions Modify

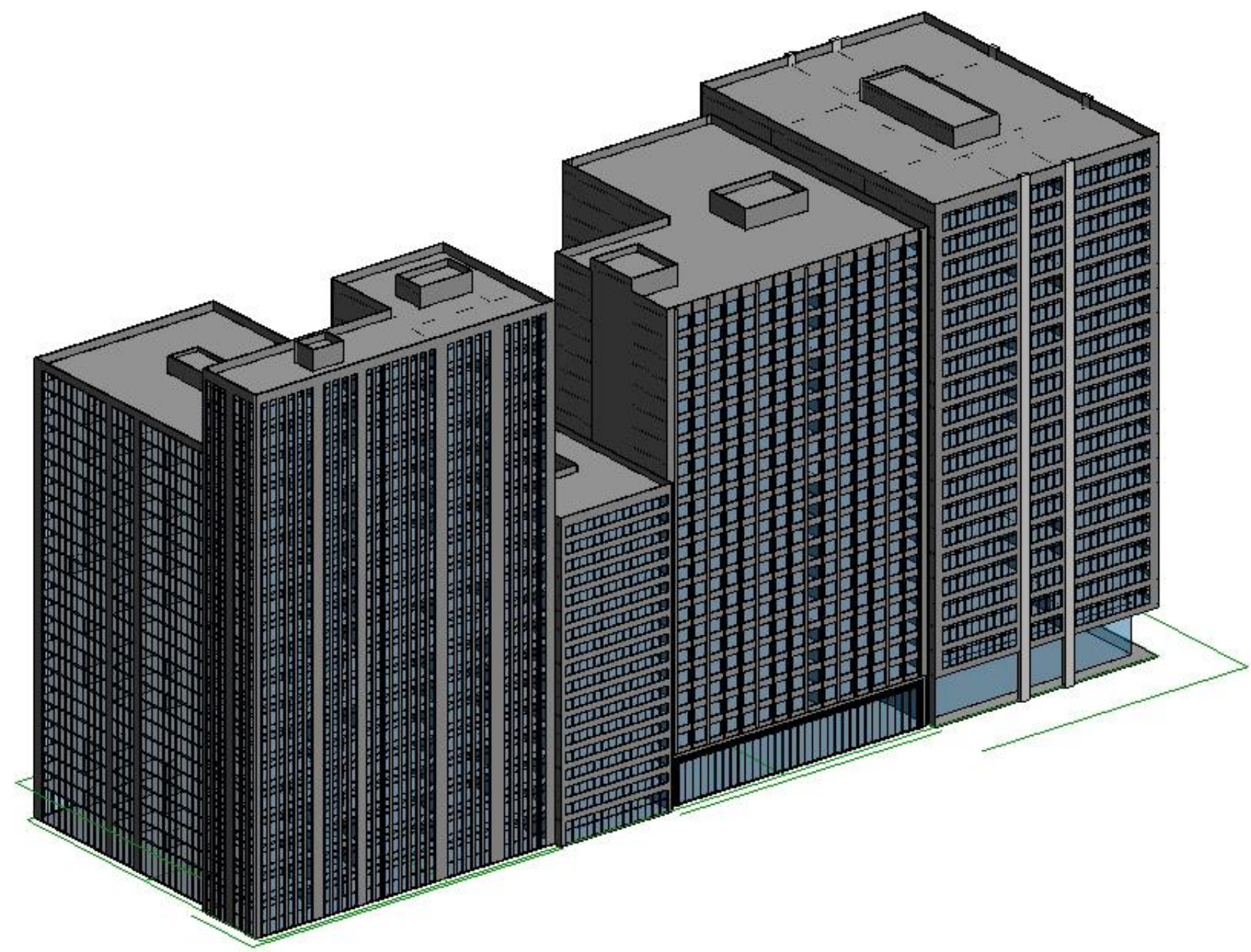
Modify Select

Wall Door Window Component Column Roof Ceiling Floor Curtain System Curtain Grid Railing Ramp Stair Model Text Model Line Model Group Room Room Separator Tag Room Area Area Boundary Tag Area By Face Shaft Wall Vertical Dormer Level Grid Set Show Ref. Plane Viewer Work Plane

Build Circulation Model Room & Area Opening Datum Work Plane

Project Browser - 0 - ...

- Views (all)
- Floor Plans
 - Level 1
 - Site
- Ceiling Plans
 - Level 1
- 3D Views
 - Copy of {3D {3D}}
- Elevations (Build
 - East
 - North
 - South
 - West
- Legends
- Schedules/Quant
 - Level Schedule
 - Offices
 - Room Schedule
- Sheets (all)
- Families
- Groups
- Revit Links



1/8" = 1'-0"

Click to select, TAB for alternates, CTRL adds, SHIFT unselects.

Main Model

0 - Site - Schedule: Room Schedule

Type a keyword or phrase

Sign In

Architecture

Structure

Systems

Insert

Annotate

Analyze

Massing & Site

Collaborate

View

Manage

Add-Ins

CASE

Extensions

Modify

Modify Schedule/Quantities

Properties

Category: 0.0

Parameter:

Format Unit

Calculated

Insert

Delete

Resize

Hide

Unhide All

Insert

Delete

Resize

Merge

Unmerge

Insert Image

Clear Cell

Group

Ungroup

Shading

Borders

Reset

Font

Align Horizontal

Align Vertical

Highlight in Model

Show

Hide

Isolate

Explain

Properties

Parameters

Columns

Rows

Titles & Headers

Appearance

Element

Not Placed/Unenclosed

Error

Modify Schedule/Quantities

Project Browser - 0 - ...

Views (all)

Floor Plans

Level 1

Site

Ceiling Plans

Level 1

3D Views

Copy of {3D (3D)}

Elevations (Build

East

North

South

West

Legends

Schedules/Quant

Level Schedule

Offices

Room Schedule

Sheets (all)

Families

Groups

Revit Links

Building 1	Level 25	Core	Elevator Core	266	864						
Building 2	Level 02	Office	Office 3	1	3,391	151	12/31/2024	1/1/2014		2.02.1	
Building 2	Level 02	Office	Office 2	2	4,868	152	12/31/2021	1/1/2011		2.02.2	
Building 2	Level 02	Office	Office 5	4	3,922	153	9/30/2016	10/1/2011		2.02.4	
Building 2	Level 02	Office	Office 6	5	3,374	154	7/31/2019	8/1/2013		2.02.5	
Building 2	Level 02	Office	Office 7	6	8,780	155	2/28/2016	3/1/2013		2.02.6	
Building 2	Level 02	Circulation	Hallway	9	2,386						
Building 2	Level 02	Core	Core	10	2,246						
Building 2	Level 01	Core	Core	11	2,246						
Building 2	Level 01	Circulation	Lobby	12	22,680						
Building 2	Level 03	Office	Office 3	13	3,963	156	1/31/2016	2/1/2011		2.03.13	
Building 2	Level 03	Office	Office 2	14	5,199	157	6/30/2016	7/1/2011		2.03.14	
Building 2	Level 03	Office	Office 5	16	3,018	158	8/31/2022	9/1/2012		2.03.16	
Building 2	Level 03	Office	Office 6	17	3,374	159	10/31/2019	11/1/2013		2.03.17	
Building 2	Level 03	Office	Office 7	18	5,625	160	5/31/2022	6/1/2013		2.03.18	
Building 2	Level 03	Office	Office 1	20	3,130	161	5/31/2016	6/1/2013		2.03.20	
Building 2	Level 03	Circulation	Hallway	21	2,386						
Building 2	Level 03	Core	Core	22	2,246						
Building 2	Level 04	Office	Office 3	23	8,283	162	11/30/2017	12/1/2012		2.04.23	
Building 2	Level 04	Office	Office 5	26	3,922	163	7/31/2020	8/1/2013		2.04.26	
Building 2	Level 04	Office	Office 6	27	8,237	164	11/30/2019	12/1/2014		2.04.27	
Building 2	Level 04	Office	Office 1	30	3,917	165	3/31/2017	4/1/2013		2.04.30	
Building 2	Level 04	Circulation	Hallway	31	2,386						
Building 2	Level 04	Core	Core	32	2,246						
Building 2	Level 05	Office	Office 3	33	7,332	166	6/30/2021	7/1/2011		2.05.33	
Building 2	Level 05	Office	Office 2	34	1,450	167	9/30/2021	10/1/2013		2.05.34	
Building 2	Level 05	Office	Office 4	35	3,393	168	6/30/2021	7/1/2013		2.05.35	
Building 2	Level 05	Office	Office 5	36	7,321	169	11/30/2020	12/1/2013		2.05.36	
Building 2	Level 05	Office	Office 7	38	1,442	170	5/31/2017	6/1/2011		2.05.38	
Building 2	Level 05	Office	Office 8	39	3,372	171	3/31/2021	4/1/2011		2.05.39	
Building 2	Level 05	Circulation	Hallway	41	2,386						
Building 2	Level 05	Core	Core	42	2,246						
Building 2	Level 06	Office	Office 3	43	3,391	172	11/30/2023	12/1/2014		2.06.43	
Building 2	Level 06	Office	Office 2	44	1,450	173	3/31/2016	4/1/2013		2.06.44	
Building 2	Level 06	Office	Office 4	45	5,342	174	6/30/2020	7/1/2014		2.06.45	
Building 2	Level 06	Office	Office 6	47	5,372	175	7/31/2019	8/1/2012		2.06.47	
Building 2	Level 06	Office	Office 7	48	8,780	176	6/30/2016	7/1/2011		2.06.48	
Building 2	Level 06	Circulation	Hallway	51	2,386						
Building 2	Level 06	Core	Core	52	2,246						
Building 2	Level 07	Office	Office 3	53	12,229	177	5/31/2016	6/1/2013		2.07.53	
Building 2	Level 07	Office	Office 6	57	3,374	178	10/31/2018	11/1/2012		2.07.57	
Building 2	Level 07	Office	Office 7	58	1,442	179	7/31/2016	8/1/2013		2.07.58	

Ready

Main Model

10:21 PM 12/1/2014

Modify Schedule/Quantities

Project Browser - Building 1

<Room Schedule>									
A	B	C	D	E	F	G	H	I	J
Level	Department	Number	Name	Area	Tenant	Lease Start	Lease End	Office ID	Lease Expiring
Level 01	Circulation	23	Lobby	16,464					
Level 01	Core	24	Core	864					
Level 02	Circulation	3	Hallway	3,104					
Level 02	Core	11	Elevator C	864					
Level 02	Office	1	Office 01	3,042				1.02.1	
Level 02	Office	2	Office 02	917				1.02.2	
Level 02	Office	4	Office 03	917				1.02.4	
Level 02	Office	5	Office 04	1,892				1.02.5	
Level 02	Office	9	Office 05	1,073				1.02.9	
Level 02	Office	7	Office 07	2,867				1.02.7	
Level 02	Office	10	Office 09	2,126				1.02.10	
Level 03	Circulation	14	Hallway	3,104					
Level 03	Core	22	Core	864					
Level 03	Office	12	Office 01	3,998				1.03.12	
Level 03	Office	15	Office 03	2,847				1.03.15	
Level 03	Office	20	Office 05	3,237				1.03.20	
Level 03	Office	18	Office 07	2,867				1.03.18	
Level 04	Circulation	27	Hallway	3,104					
Level 04	Core	35	Elevator C	864					
Level 04	Office	25	Office 01	1,892				1.04.25	
Level 04	Office	26	Office 02	917				1.04.26	
Level 04	Office	28	Office 03	917				1.04.28	
Level 04	Office	29	Office 04	1,892				1.04.29	
Level 04	Office	33	Office 05	1,073				1.04.33	
Level 04	Office	32	Office 06	1,073				1.04.32	
Level 04	Office	31	Office 07	1,755				1.04.31	
Level 04	Office	30	Office 08	1,112				1.04.30	
Level 04	Office	34	Office 09	2,126				1.04.34	
Level 05	Circulation	38	Hallway	3,104					
Level 05	Core	46	Elevator C	864					
Level 05	Office	36	Office 01	1,892				1.05.36	
Level 05	Office	37	Office 02	917				1.05.37	
Level 05	Office	39	Office 03	917				1.05.39	
Level 05	Office	40	Office 04	1,892				1.05.40	
Level 05	Office	44	Office 05	1,073				1.05.44	
Level 05	Office	43	Office 06	1,073				1.05.43	

Properties

Schedule

Schedule: Room ScheEdit Type

Identity Data

View Template<None>

View NameRoom Schedule

DependencyIndependent

Phasing

PhaseNew Construc...

Other

FieldsEdit...

FilterEdit...

Sorting/GroupingEdit...

FormattingEdit...

AppearanceEdit...

Embedded Sche...Edit...

Properties helpApply

0 - Site - 3D View: {3D}

Type a keyword or phrase

Sign In

Architecture Structure Systems Insert Annotate Analyze Massing & Site Collaborate View Manage Add-Ins CASE Extensions Modify

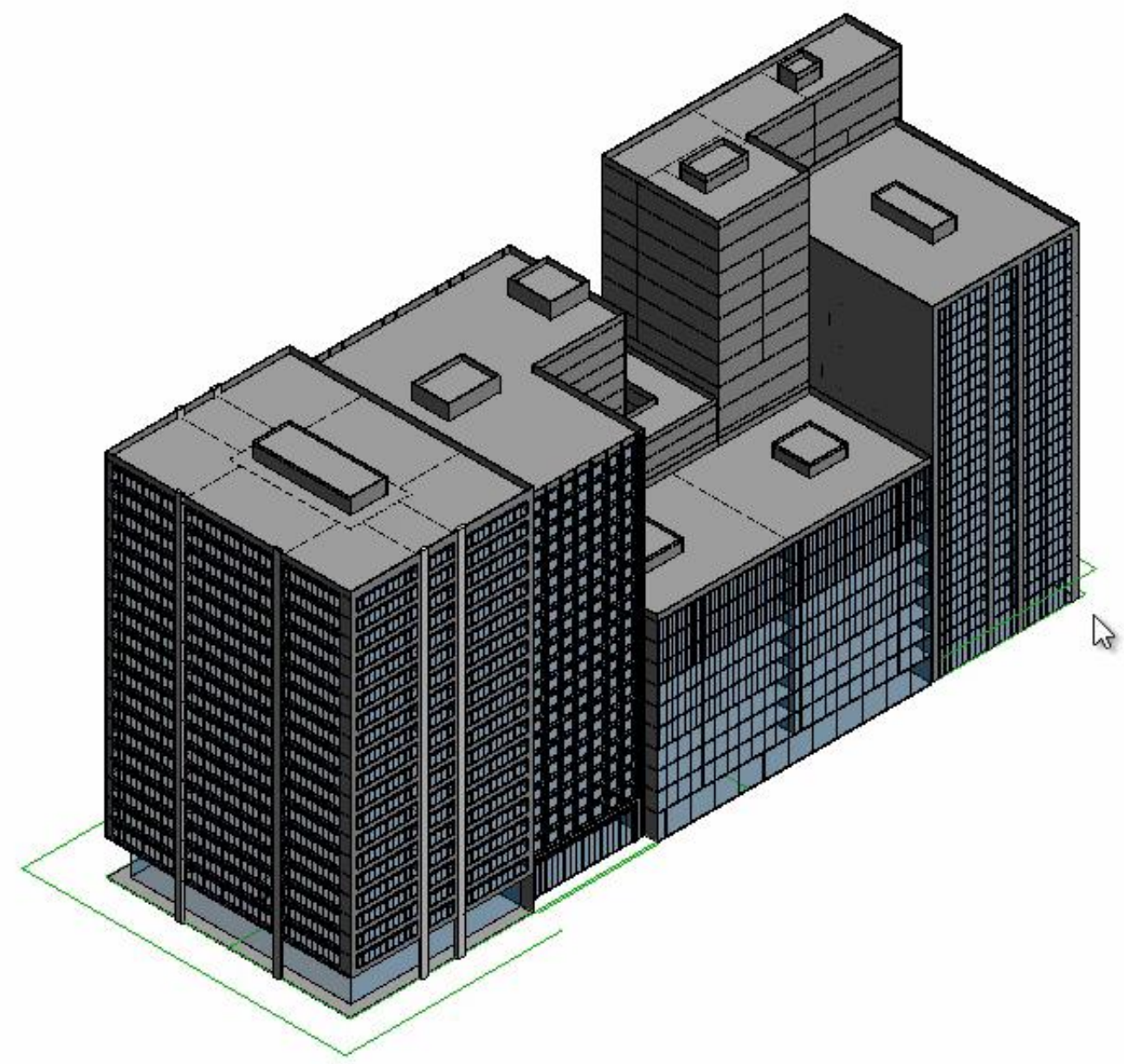
Modify Select

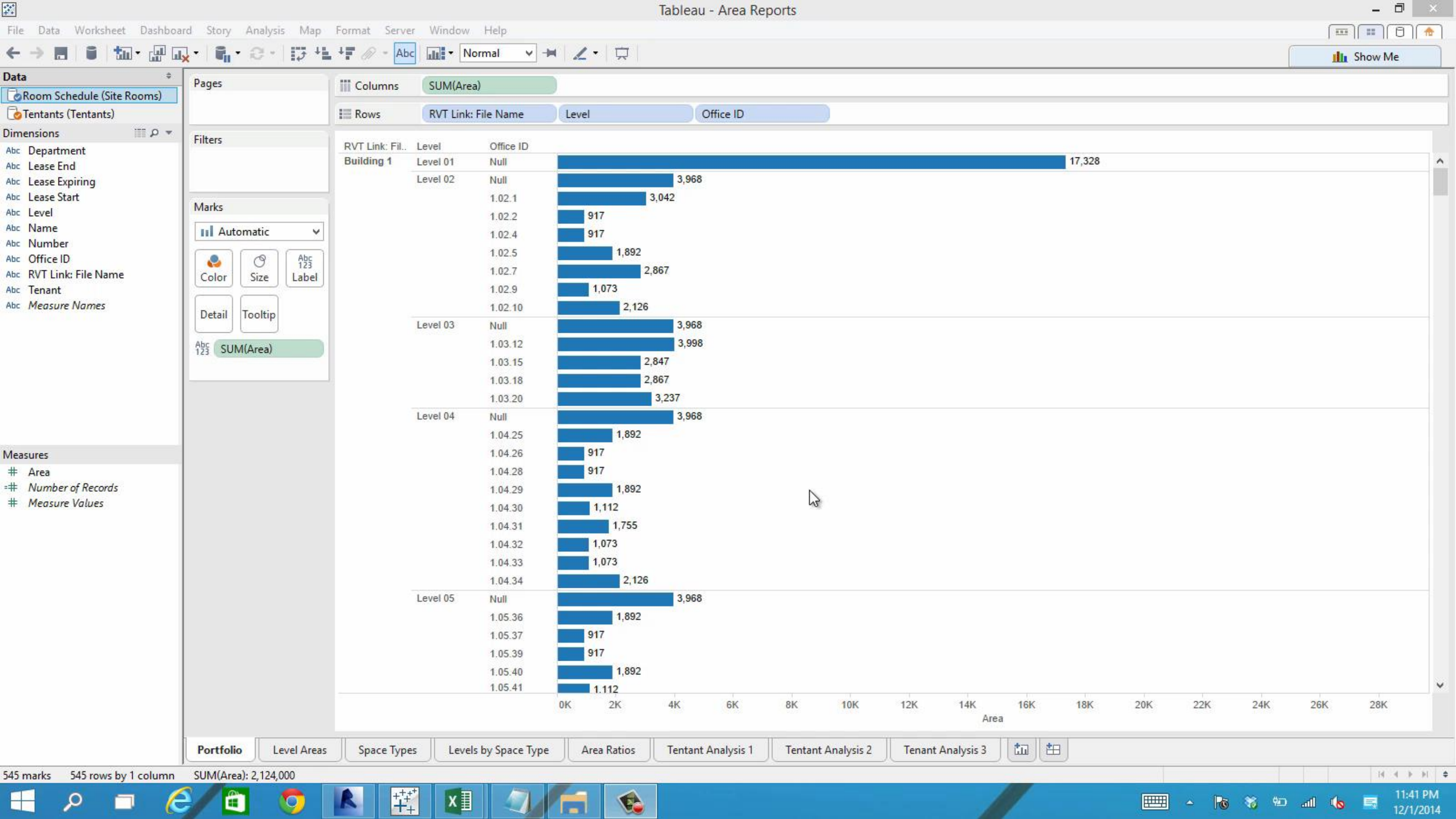
Wall Door Window Component Column Roof Ceiling Floor Curtain System Curtain Grid Railing Ramp Stair Model Text Model Line Model Group Room Room Separator Tag Room Area Area Boundary Tag Area By Face Shaft Wall Vertical Dormer Level Grid Set Ref. Plane Viewer Work Plane

Build Circulation Model Room & Area Opening Datum Work Plane

Project Browser - 0 - ...

- Views (all)
- Floor Plans
 - Level 1
 - Site
- Ceiling Plans
 - Level 1
- 3D Views
 - Copy of {3D {3D}}
- Elevations (Build)
 - East
 - North
 - South
 - West
- Legends
- Schedules/Quant
 - Level Schedule
 - Offices
 - Room Schedule
- Sheets (all)
- Families
- Groups
- Revit Links





Building 1 - 3D View: {3D}

Type a keyword or phrase

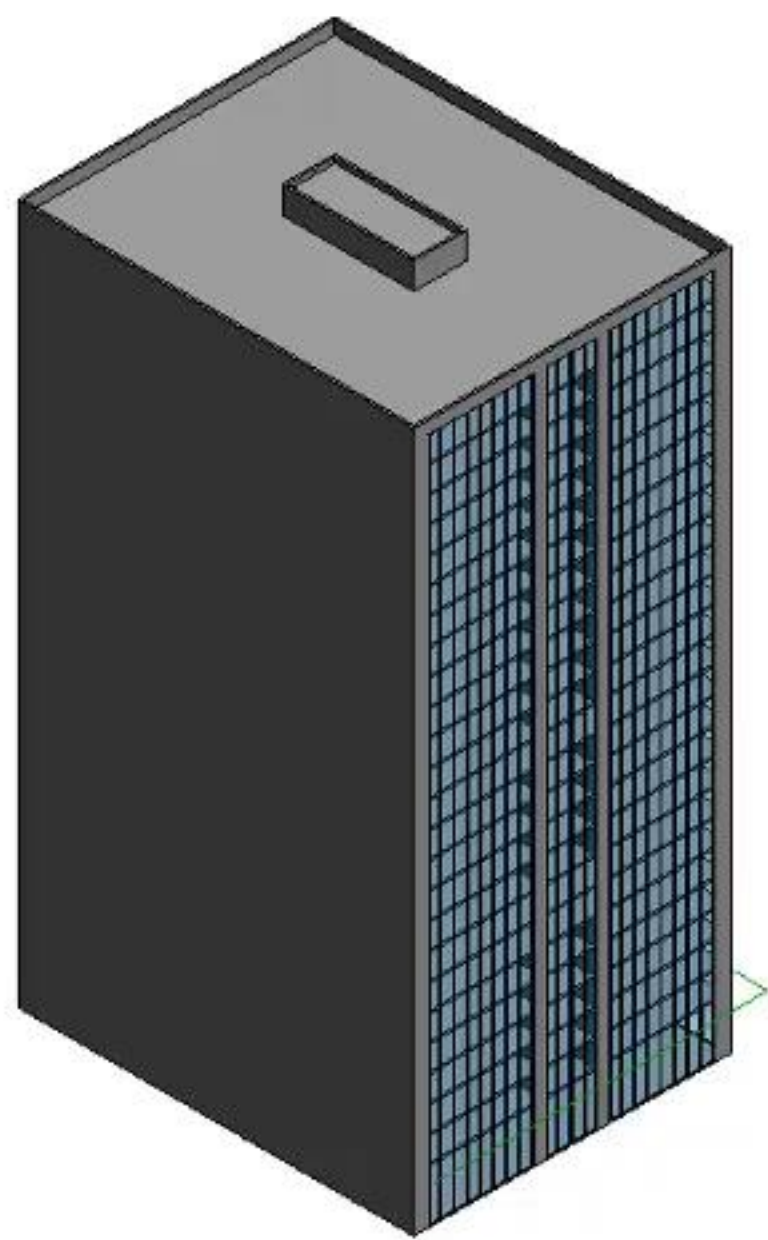
Sign In

Architecture Structure Systems Insert Annotate Analyze Massing & Site Collaborate View Manage Add-Ins CASE Extensions Modify

Modify Materials Object Styles Project Parameters Transfer Project Standards Structural Settings Location Coordinates Position Additional Settings Design Options Add to Set Pick to Edit Main Model Manage Images Manage Links Decal Types Starting View Phases Phasing Selection Save Load Edit IDs of Selection Select by ID Warnings Inquiry Macros

Select Settings Project Location Design Options Manage Project Phasing Selection Inquiry Macros

- Project Browser - Building 1
- Level 05
 - Level 06
 - Level 07
 - Level 08
 - Level 09
 - Level 10
 - Level 11
 - Level 12
 - Level 13
 - Level 14
 - Level 15
 - Level 16
 - Level 17
 - Level 18
 - Level 19
 - Level 20
 - Level 21
 - Level 22
 - Level 23
 - Level 24
 - Level 25
 - Roof
 - Site
 - Ceiling Plans
 - 3D Views
 - Massing
 - {3D}
 - Elevations (Building Elevation)
 - Legends
 - Schedules/Quantities
 - Level Schedule
 - Room Schedule
 - Sheets (all)
 - Families
 - Annotation Symbols



Properties

3D View

3D View: {3D} Edit Type

Graphics

View Scale	1/8" = 1'-0"
Scale Value	1: 96
Detail Level	Medium
Parts Visibility	Show Original
Visibility/Grp...	Edit...
Graphic Displa...	Edit...
Discipline	Coordination
Default Analys...	None
Sun Path	<input type="checkbox"/>

Identity Data

View Template	<None>
View Name	{3D}
Dependency	Independent
Title on Sheet	

Extents

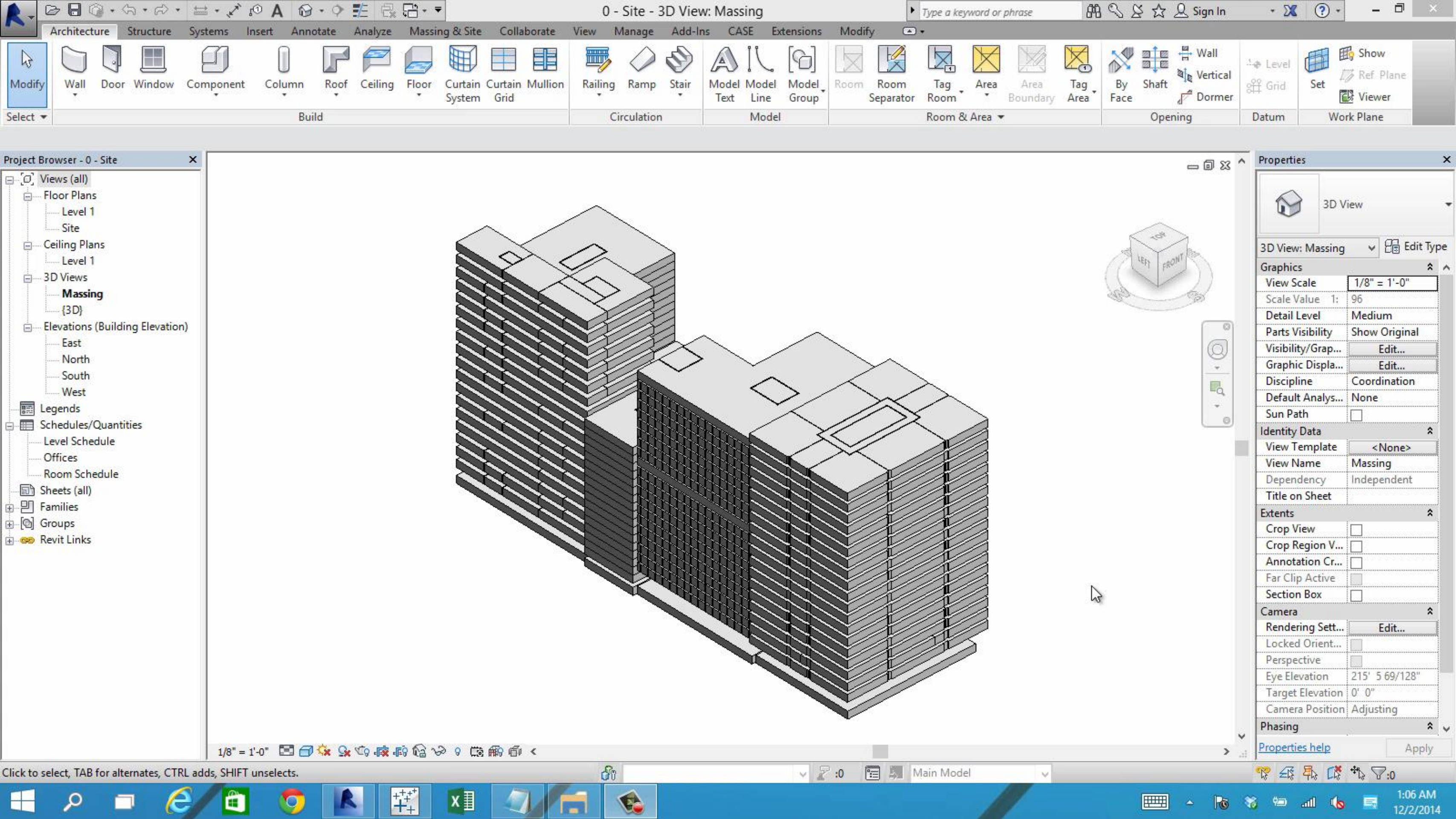
Crop View	<input type="checkbox"/>
Crop Region V...	<input type="checkbox"/>
Annotation Cr...	<input type="checkbox"/>
Far Clip Active	<input type="checkbox"/>
Section Box	<input type="checkbox"/>

Camera

Rendering Sett...	Edit...
Locked Orient...	<input type="checkbox"/>
Perspective	<input type="checkbox"/>
Eye Elevation	219' 3 1/128"
Target Elevation	0' 0"
Camera Position	Adjusting

Phasing

Properties help Apply

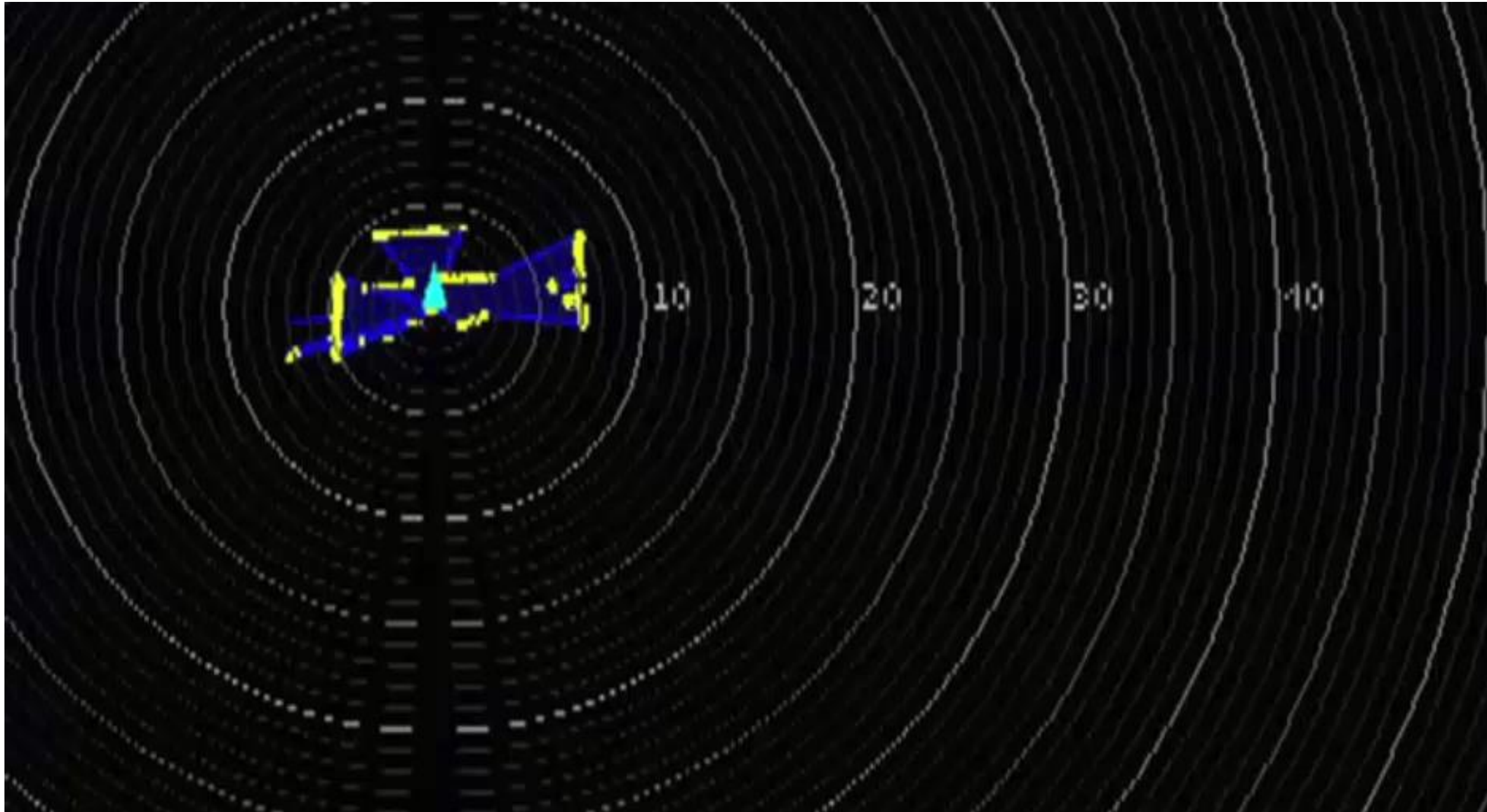


So, what's next?

Continuous Building Capture

UAV As-building

BLDGS = DATA

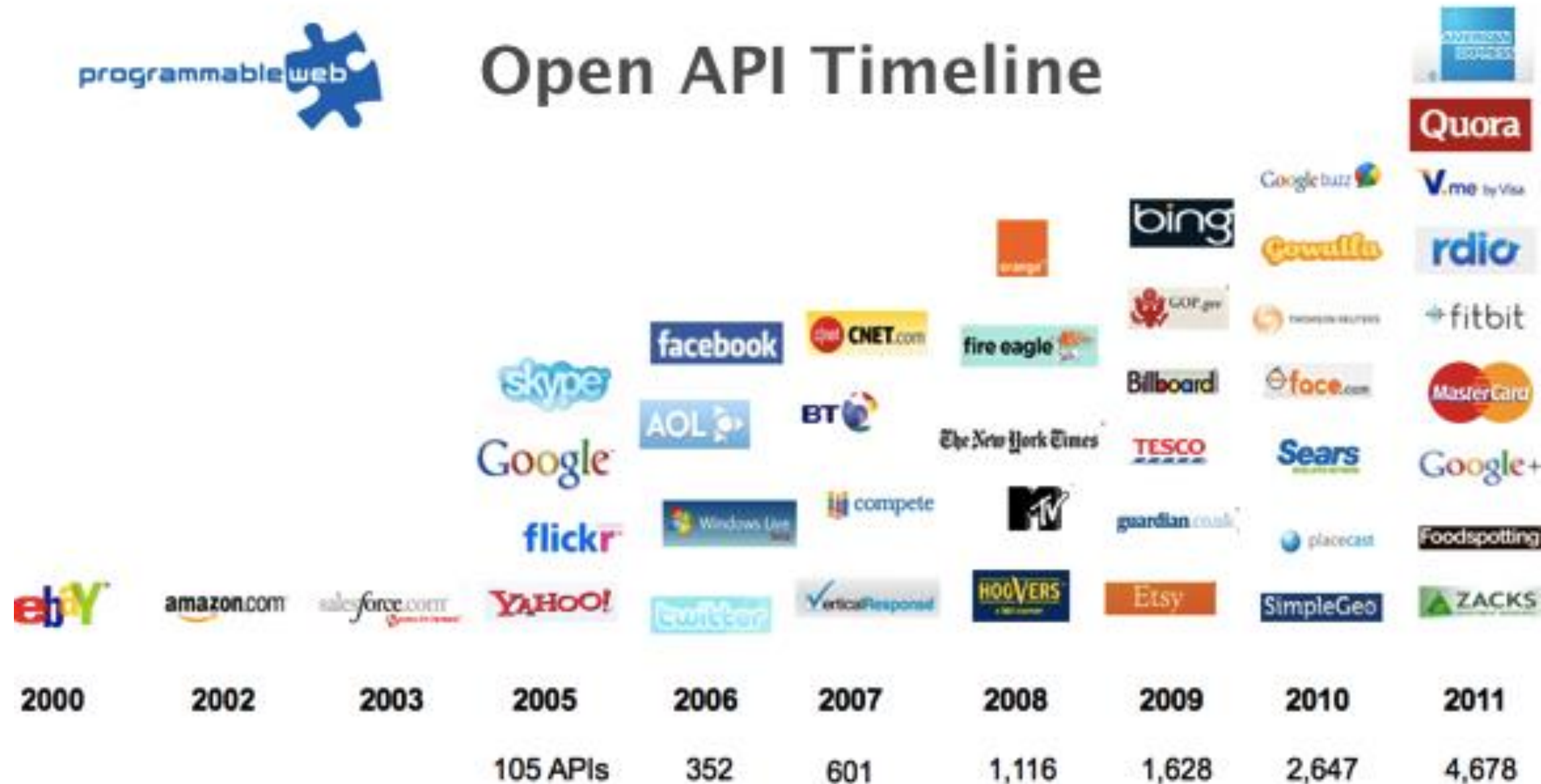


Source: <http://diydrones.com/profiles/blogs/indoors-autonomous-quadcopter>

Building APIs

Open platforms for improving building performance

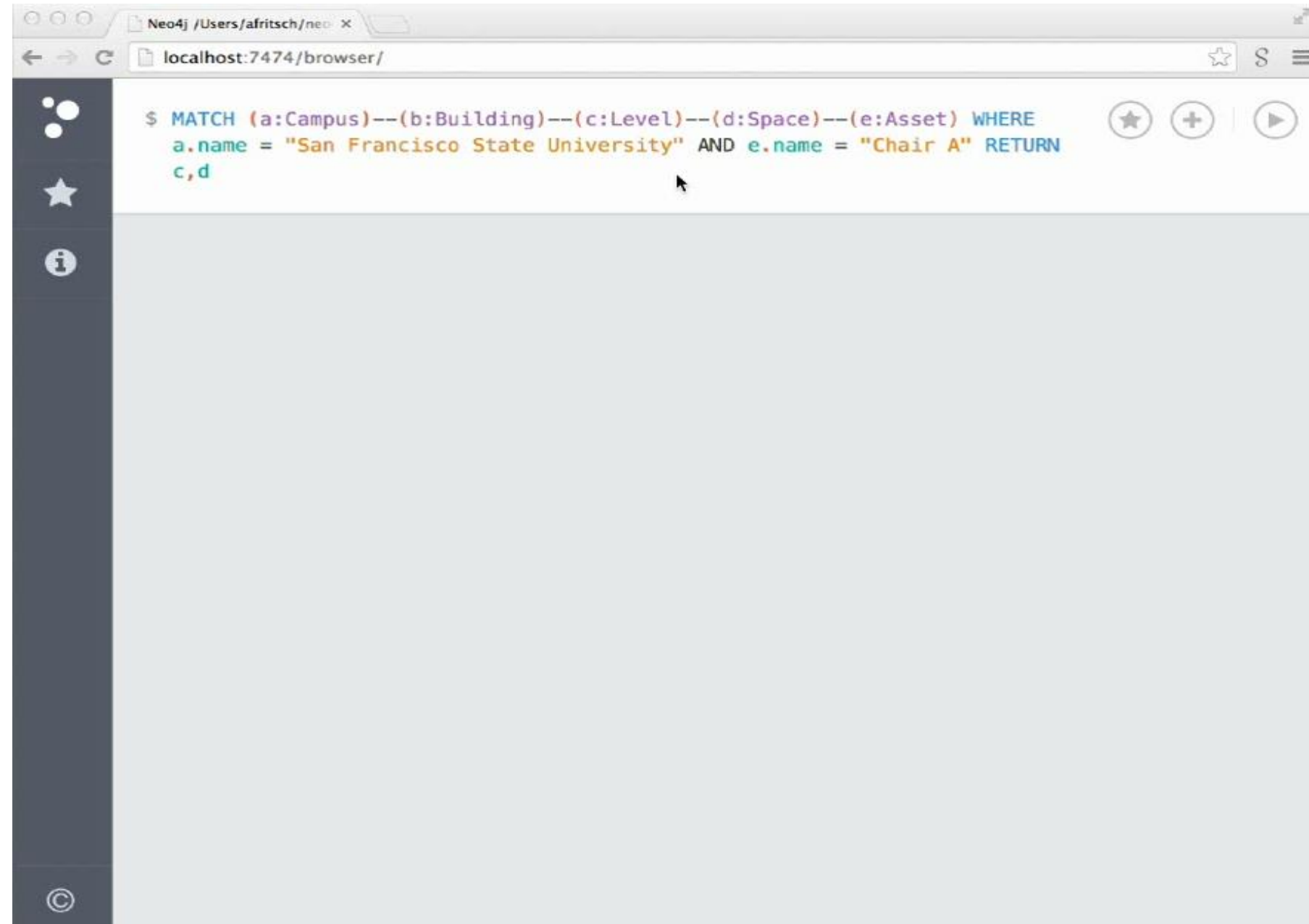
BLDGS = DATA



Flexible Building Information Databases

Graph Schema

BLDGS = DATA



Spatial Scanning

Beyond Coordination & Clash Detection

BLDGS = DATA



Source: <http://www.youtube.com/watch?v=SIOUhjL5fKI#t=23>

Spatial Usage Metrics

BMS, SIMS, CAFM, Sensors & Controls

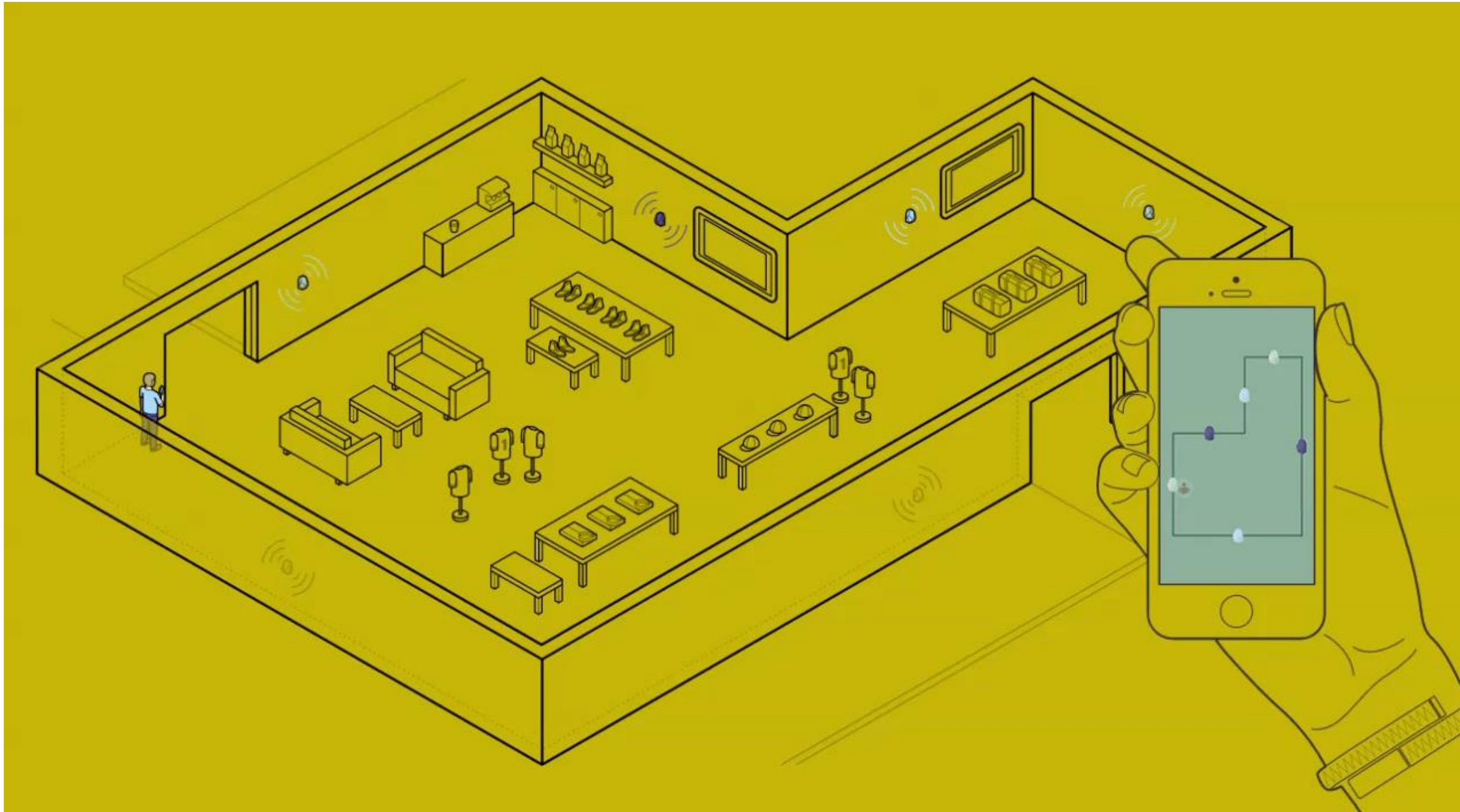
BLDGS = DATA



Occupancy Awareness

Indoor Positioning

BLDGS = DATA



Source: <http://estimote.com/indoor>

**Data is a raw
renewable resource**

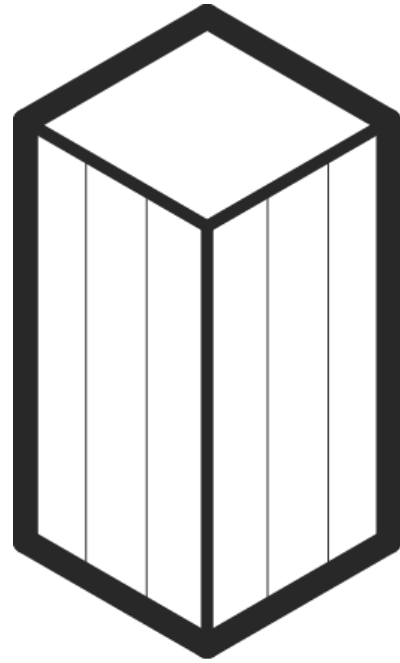
**Those that use it to
deliver value will drive
performance**

Source: <http://blog.programmableweb.com/2011/01/03/api-growth-doubles-in-2010-social-and-mobile-are-trends/>

Thanks!

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bldgs

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data

Session Feedback

Facility Datafication: Maximizing the Value of Your Building Portfolio with Revit
Autodesk University

- Via the Survey Stations, email or mobile device
- AU 2015 passes given out each day!
- Best to do it right after the session
- Instructors see results in real-time

