

2021



A E C  
TECHNOLOGY  
PARTNERS

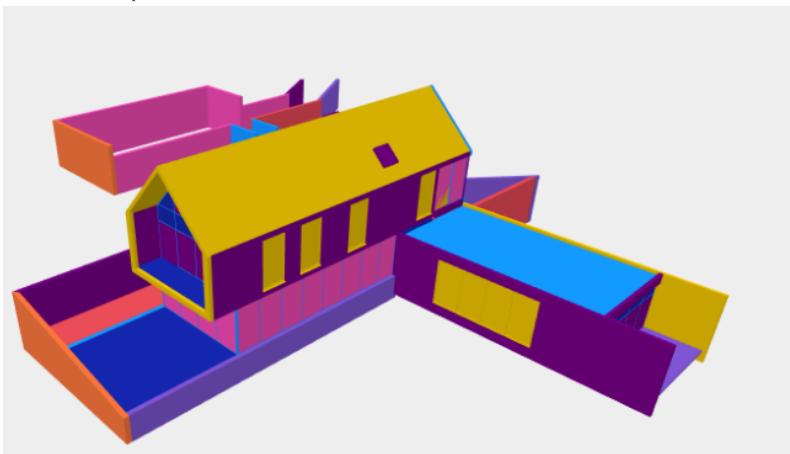
# Revit to Power BI (Arch)

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## Power BI Export tool – How does it work?

Visualize your data in 2D and 3D



Curtain Wall	64 x 128 rectangular	257616
Mullions		
Furniture	1800 x 900 mm	3600
Walls	Cavity wall_sliders	2940
Walls	CL_W1	96266
Walls	Foundation - 300mm Concrete	8947
Walls	Interior - 165 Partition (1-hr)	7582
Walls	Interior - Partition	47641
Walls	Retaining - 300mm Concrete	65444
Walls	SH_Curtain wall	51176
Walls	SIP 202mm Wall - conc clad	51808
Walls	Wall - Timber Clad	61408
<b>Total</b>		<b>654428</b>

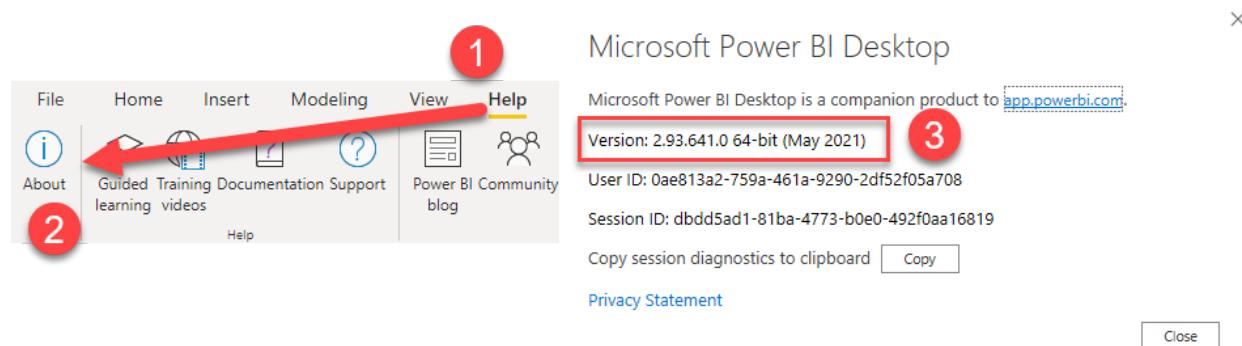
### What is Power BI?

Power BI is a data visualization platform developed by Microsoft. It allows you to unify data from many sources to create interactive, immersive dashboards and reports that help you gain deeper data insight into your project.

With the *Power BI Export tool*, which is part of the MG toolkit, you can now use Revit data for creating tables, graphs, and visual representations of a BIM model. Once exported, it allows you to efficiently review and manipulate the data without needing to open the Revit file. Perfect for meetings, creating reports or quick reviews.

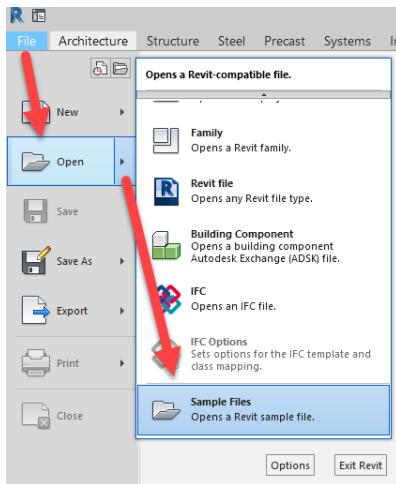
### Getting Started

Check to make sure you are at least on this version Power BI or higher. If not, stop and update Power BI to a newer version before continuing.



## Revit Architectural Building Example

We suggest starting with a small model like the example that comes by default with Revit called “*rac\_basic\_sample\_project.rvt*”. You can get to it by using the below method.



## Power BI Export – How does it work?

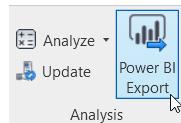
Power BI Export is a new tool added to the MG toolkit for Revit that allows you to export and analyze data based on your selection or an active view.

### Initial 2D or 3D View Setup

You will need to setup a 2D or 3D view before starting the tool. The view needs to be set so it is showing only the elements that need to be exported to Power BI. The reason for this is because of the performance of the tool when exporting to the Excel Spreadsheet.

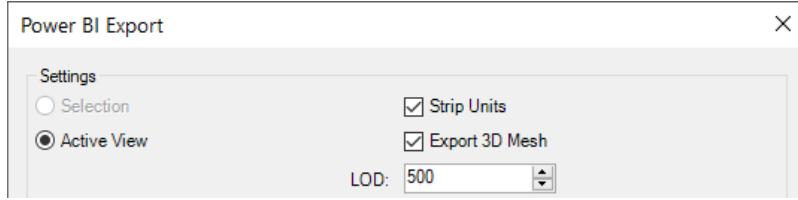
In our testing of large models, being 300MB or larger, we saw the export process to be up to 5 minutes in length. We must convert the geometry and the detail level of that geometry to make it work in Power BI. That is the reason for the LOD option in our tool, if the export performance degrades then try changing the LOD value to 250 and try again.

Click on the *MGaec tab* -> Go to *Analysis Panel* -> Select *Power BI Export* tool



### Settings

*Active View* is the default, and recommended, but you can select elements before starting the tool.



**Strip Units:** Exports dimensions without units (recommended for working with Power BI).

**Export 3D Mesh:** Exports 3D mesh geometry (if the geometry is too complex, it will export bounding box)

**LOD (Level of Detail):** Select level of detail in values from 100 to 500, helps with *Export Performance*

## Selection

Select families and elements you want to export by checking boxes in front of the elements use toolbar to:



- Deselect all nodes
- Invert checked nodes
- Collapse all nodes
- Expand all nodes

## Visual

Opens a folder location of Power BI visuals (2D and 3D). Remember this path or Copy it to the clipboard to use later in Power BI desktop. (C:\ProgramData\KobiLabs\Toolkit for Power BI).

## Website

Opens website to show instructions, this PDF goes into greater detail.

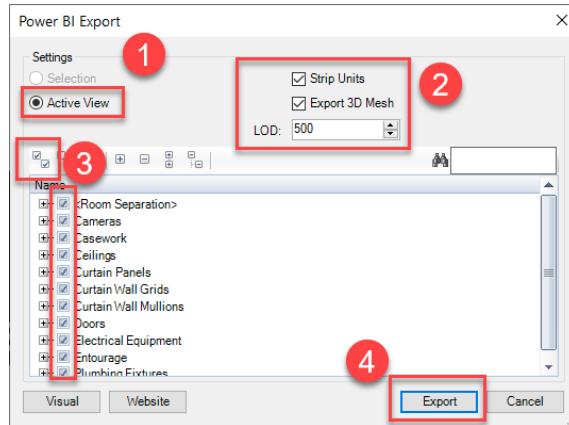
## Export

Select **Export** and save it as Excel (recommended) or CSV file.

## Export for Power BI Consumption

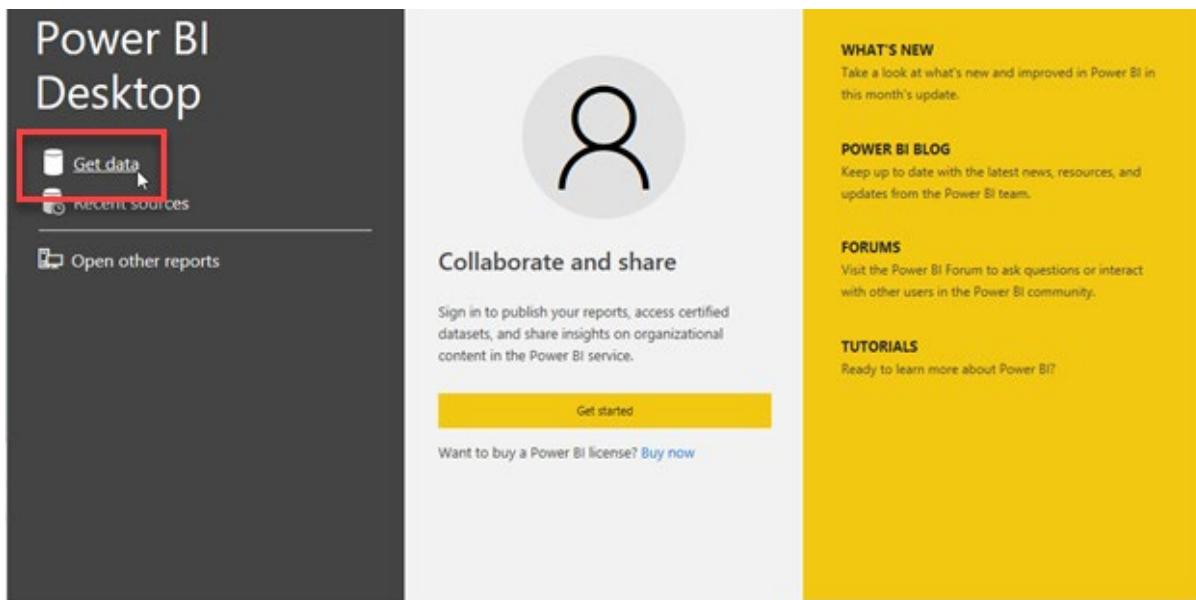
For the next step let's export an Excel Spread Sheet with these settings. This will take up to 1 minute to generate the spread sheet so be patient. Choosing only a few categories will speed up the processing. Be patient on this tool when opening and exporting with large models.

- Open the Default {3D} View from the Project Browser
- Start Export to Power BI tool
- Check Mark Strip Units, Check Mark Export 3D Mesh, and LOD set to 500
- All Categories check marked and Export



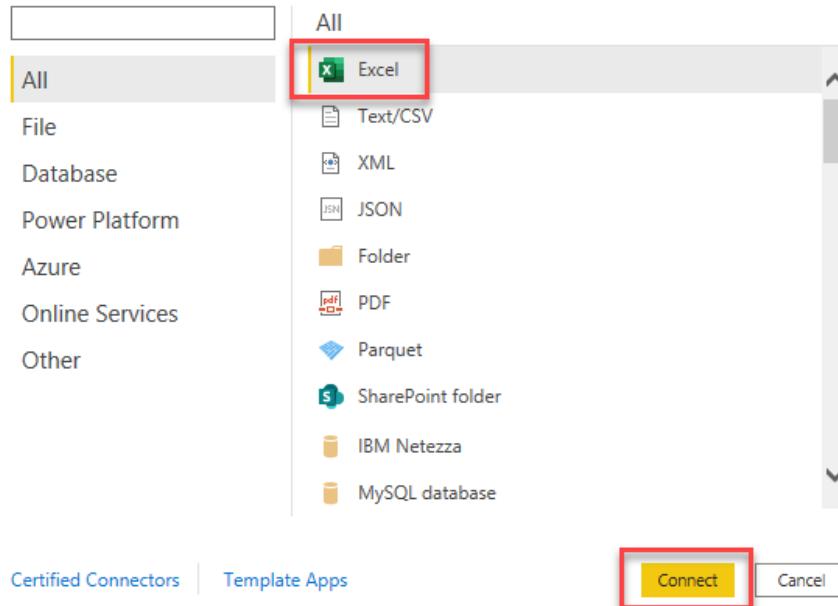
## Power BI Desktop

Open Power BI Desktop and select Get data.



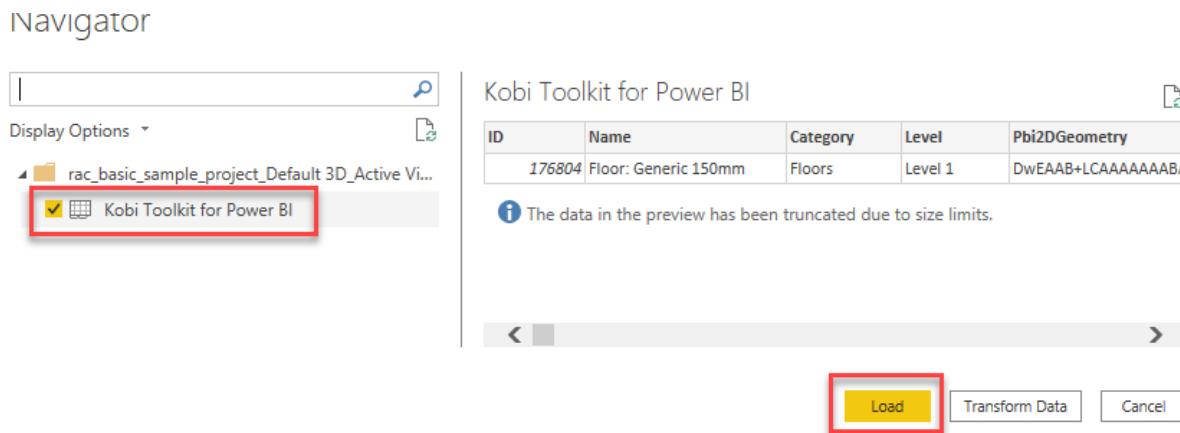
Depending on the exported data type from Revit, select *Excel* or *Text/CSV* format and select *Connect*.

## Get Data

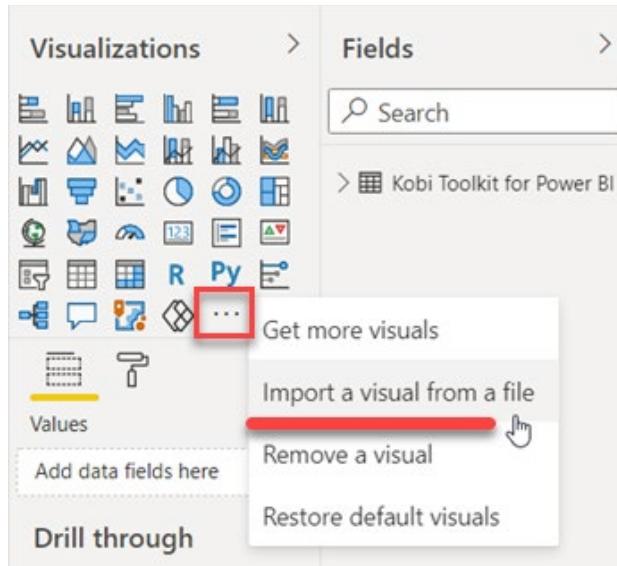


Now select the spread sheet that exported earlier.

When the Navigator dialog window opens, select *Kobi Toolkit for Power BI* and click *Load*.

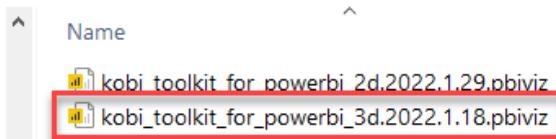


In the left side of Power BI Desktop app is the *Visualization* panel. Click on *three dots (...)* and select '*Import a visual from a file*'.



Find the location of KobiLabs Power BI Visuals or paste in the path you copied earlier from Revit (Example: *C:\ProgramData\KobiLabs\Toolkit for Power BI*). For this first example select the *3D version*.

This PC > OS (C:) > ProgramData > KobiLabs > Toolkit for Power BI

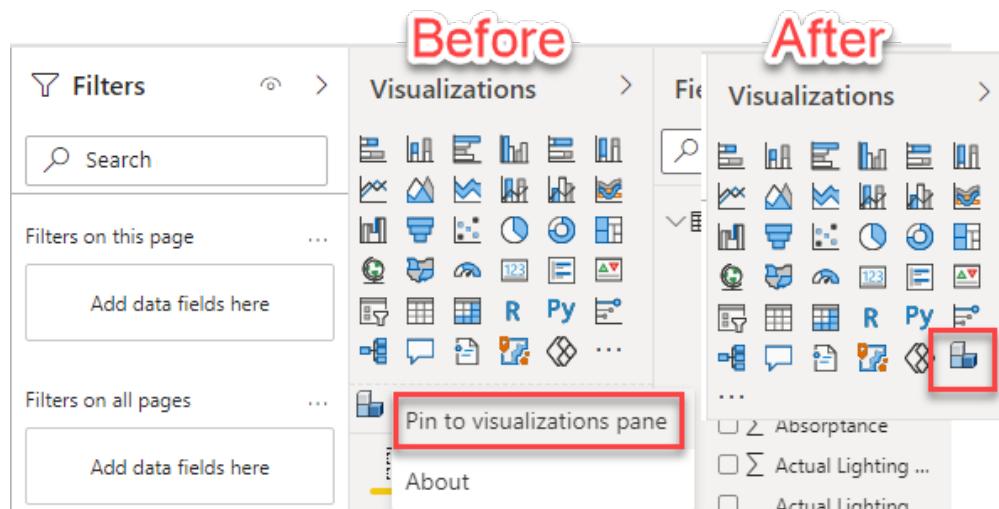


By opening this file, you can now create custom visualizations of Revit data in 3D.



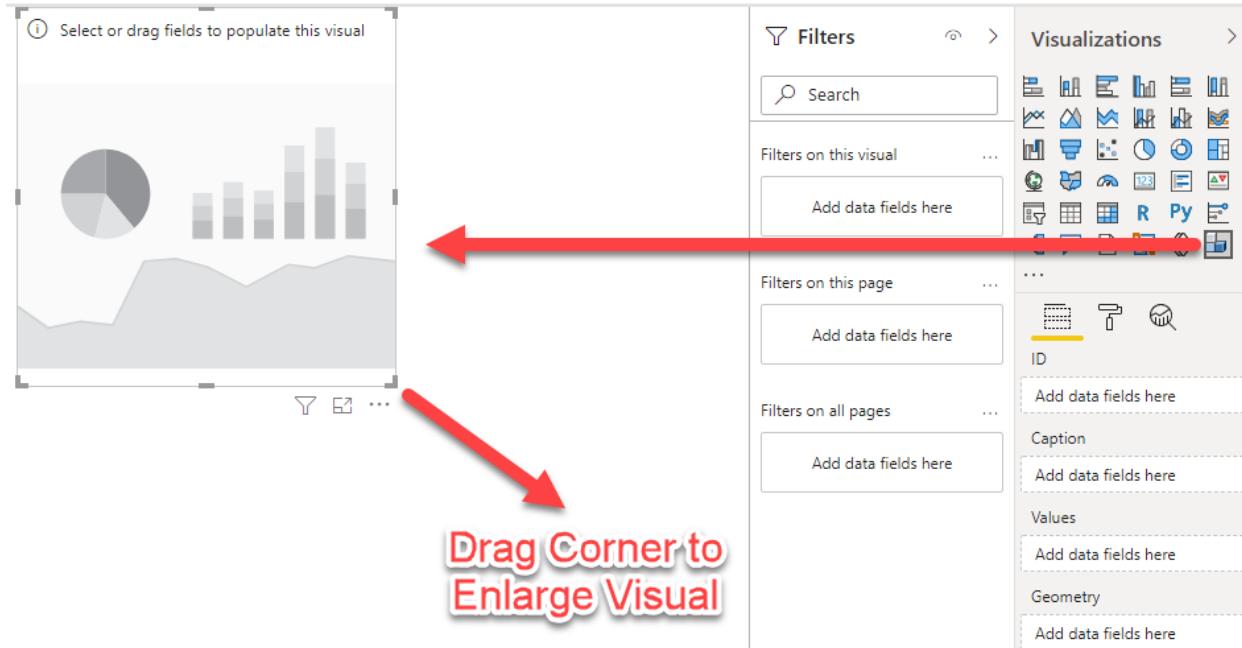
### Pin 3D Visual

Right-click on icon to *pin* the visual so it is with the other visuals the next time you open Power BI.



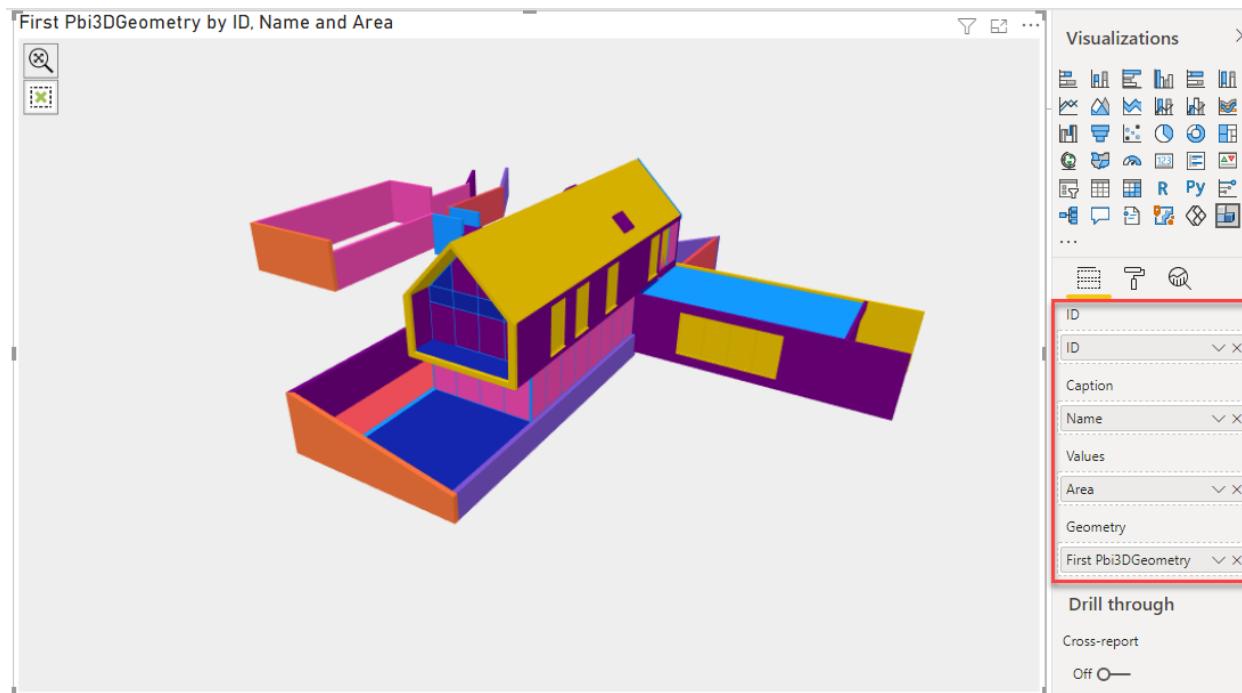
## 3D Model Example

Select **3D visualization**  and that a visual is now on the dashboard. Select the corner to enlarge it so it takes up 2/3 of the dashboard.

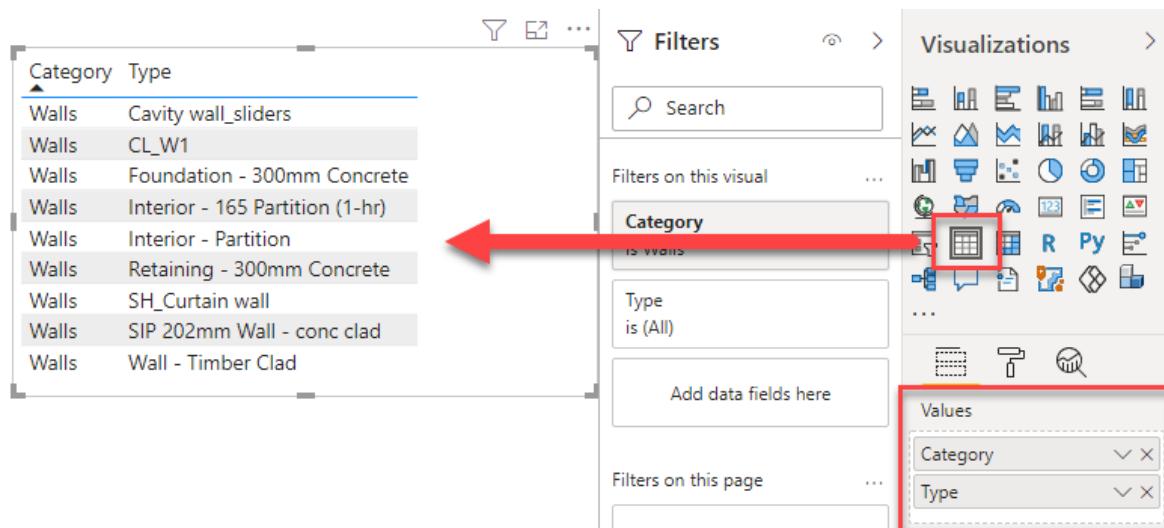


### Add Fields

In **Fields** palette select these data fields: **ID**, **Name**, **Area**, and **Pbi3DGeometry**. Insert the data by dragging and dropping in selected rows: **ID**, **Caption**, **Values**, and **Geometry**.



To put some additional meaning to the visual we will add a table to filter through the different types that are in the model. Select the *Table* visual and enlarge it if needed. Add these (2) fields to the values row: *Category* and *Type*. *Drag and drop* to add and *sort them, top is most left in the table*.



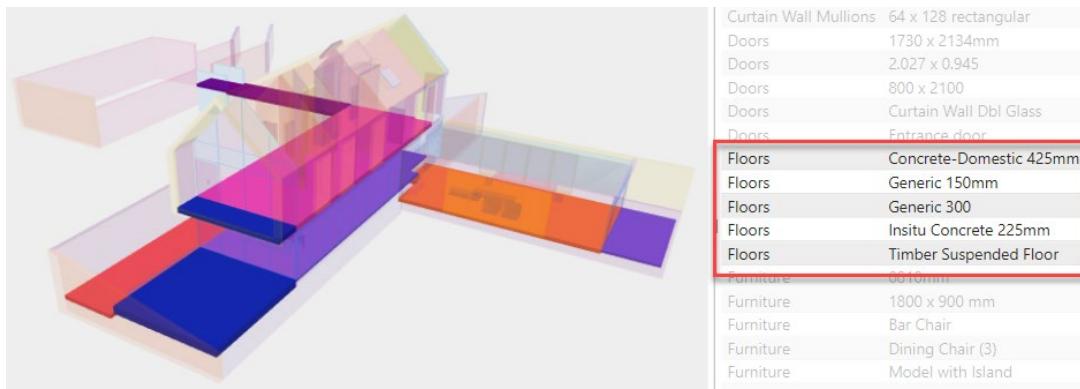
The screenshot shows a 'Table' visual on the left and the 'Filters' pane on the right. The table contains two columns: 'Category' and 'Type'. The 'Category' column lists 'Walls' multiple times with various sub-options like 'Cavity wall\_sliders', 'CL\_W1', etc. A red arrow points from the table towards the 'Filters' pane. The 'Filters' pane has sections for 'Filters on this visual' and 'Filters on this page'. Under 'Filters on this visual', there are dropdowns for 'Category' (set to 'is Walls') and 'Type' (set to 'is (All)'). Under 'Values', there are also dropdowns for 'Category' and 'Type'. A red box highlights the 'Category' field in the 'Filters' pane.

## Sort Column

Pick the *Category* column header to *sort A to Z*

Category	Type
Casework	4500_Kitchen Island
Casework	4500_Kitchen Island_DW
Curtain Panels	Glazed
Curtain Wall Mullions	64 x 128 rectangular
Doors	1730 x 2134mm
Doors	2.027 x 0.945
Doors	800 x 2100
Doors	Curtain Wall Dbl Glass
Doors	Entrance door
Floors	Concrete-Domestic 425mm

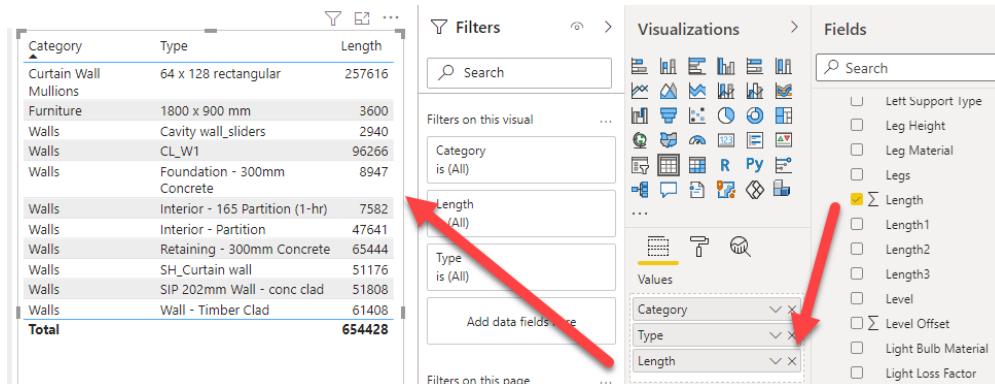
Use the **CTRL** key to select the **Floors** in the table and notice the 3D model updates showing those **Floor types**. Pick the floors again to unhighlight them in the model.



Remember, all the parameter data that you see in the Properties window in Revit are available in Power BI. It comes down to how do you want to visualize that data with a 2D or 3D model.

## Additional Table Data

We add the data field from Revit called **Length** to see how much total length of each type of wall is in the model. On the **Fields** palette drag and drop **Length** and place it below the **Type** data field. Note the table now has an **additional column** showing the **total length** for each **type of wall** in the model.



Category	Type	Length
Curtain Wall Mullions	64 x 128 rectangular	257616
Furniture	1800 x 900 mm	3600
Walls	Cavity wall_sliders	2940
Walls	CL_W1	96266
Walls	Foundation - 300mm Concrete	8947
Walls	Interior - 165 Partition (1-hr)	7582
Walls	Interior - Partition	47641
Walls	Retaining - 300mm Concrete	65444
Walls	SH_Curtain wall	51176
Walls	SIP 202mm Wall - conc clad	51808
Walls	Wall - Timber Clad	61408
<b>Total</b>		<b>654428</b>

**Filters**

Search

Filters on this visual

Category is (All)

Length (All)

Type is (All)

Add data fields...

Filters on this page

**Visualizations**

Search

Left Support type

Leg Height

Leg Material

Legs

Length

Length1

Length2

Length3

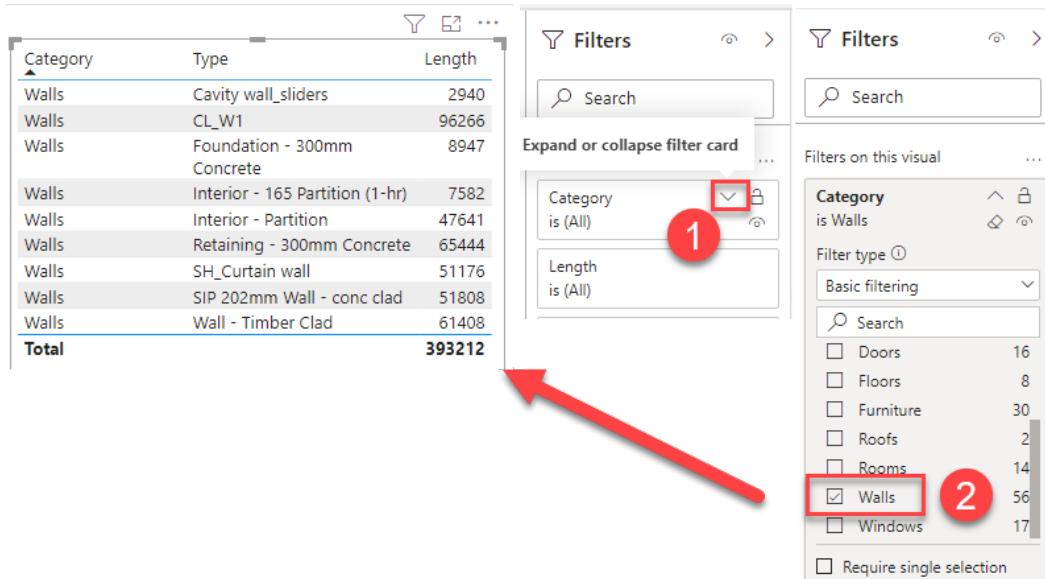
Level

Level Offset

Light Bulb Material

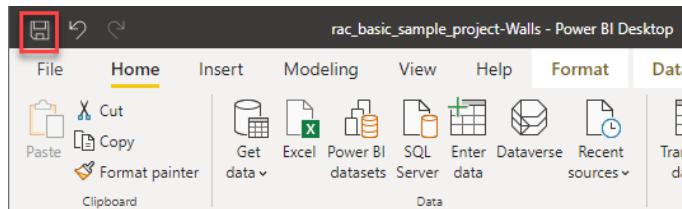
Light Loss Factor

Also note that the *category* has list has been somewhat *filtered* but let us add a filter, so it only shows the *Wall category*. On the *Filter* palette select the *down arrow* to expand the list and *check mark* the *Walls* category.

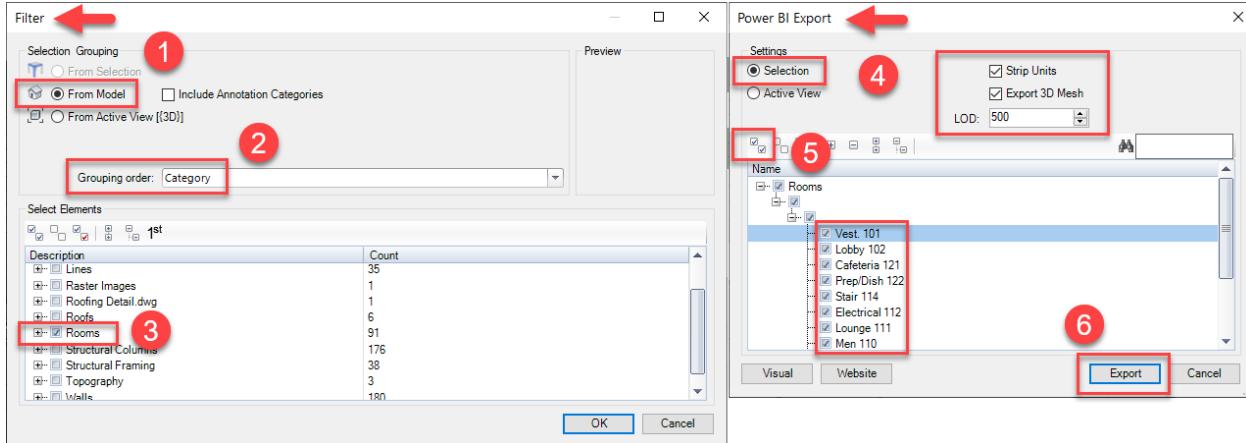


The screenshot shows a Power BI report with a table of wall types and their lengths. To the right is the 'Filters' pane. Step 1 highlights the 'Category' filter card, which shows 'is (All)' selected. Step 2 highlights the 'Walls' checkbox in the 'Filters on this visual' list, which is also checked. A red arrow points from the table to the 'Filters' pane.

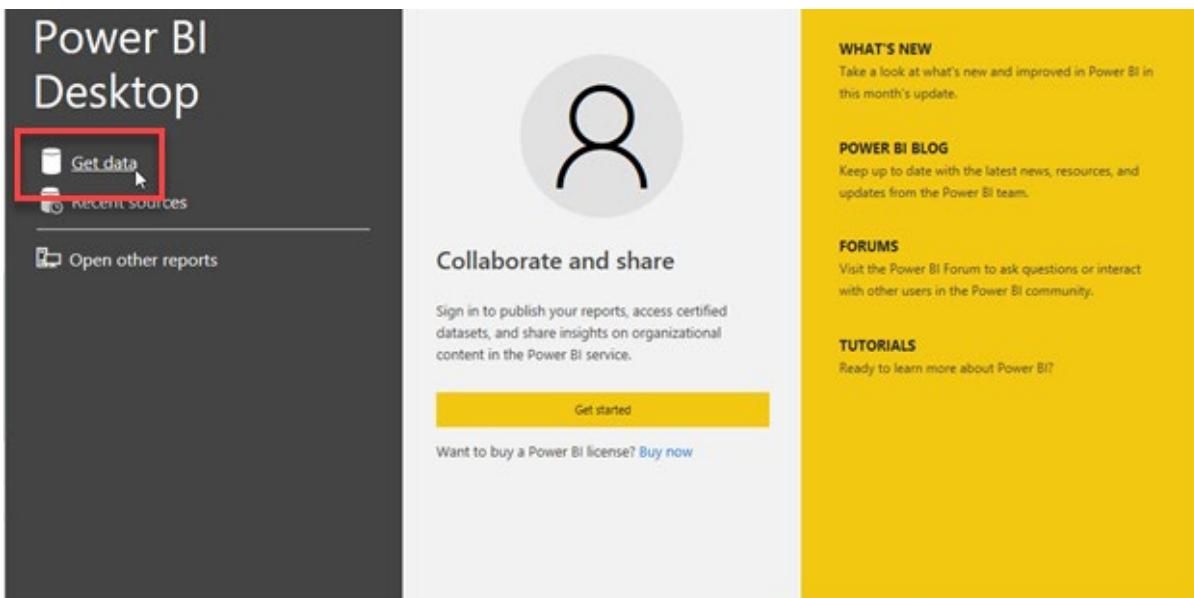
Save your newly created dashboard showing the types of walls and total lengths of those types.



Back in Revit, open the out of the box example Revit model called “*rac\_advanced\_sample\_project.rvt*” Open the *default 3D view* and use the *Pro-Revit tool* called *Filter* to choose the *Rooms* in the model. Choose the *settings below* and *export* a spread sheet called “*rac\_advanced\_sample\_project\_Default 3D Model\_Room*.”

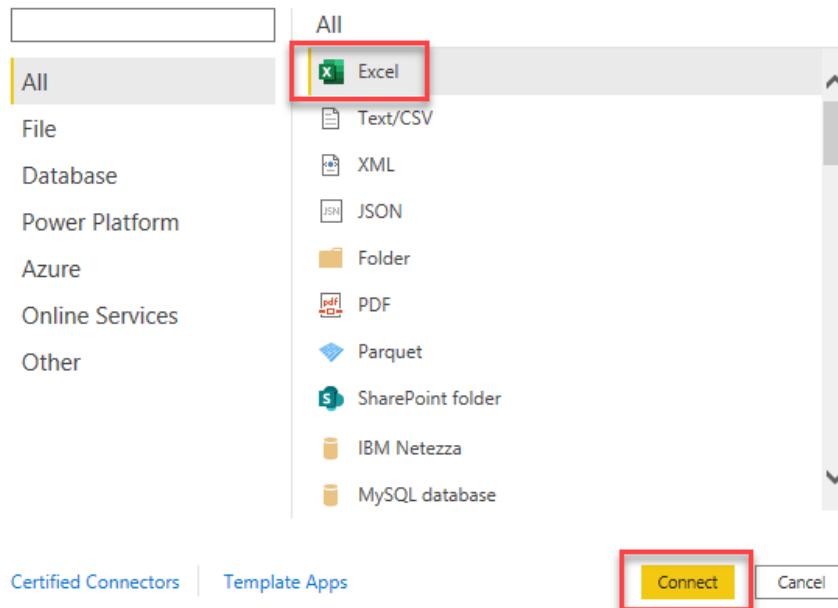


Open Power BI Desktop and select *Get data*.



Depending on the exported data type from Revit, select *Excel* or Text/CSV format and select *Connect*.

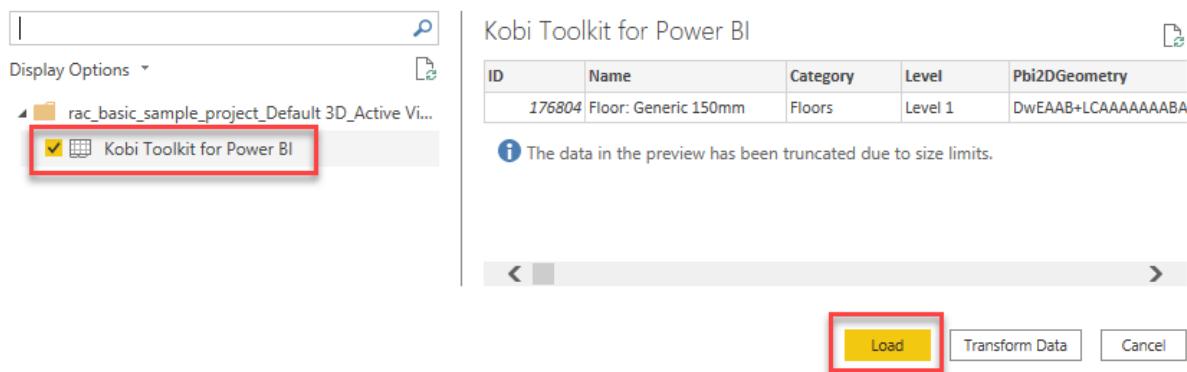
## Get Data



Now *select the spread sheet* that *exported earlier*.

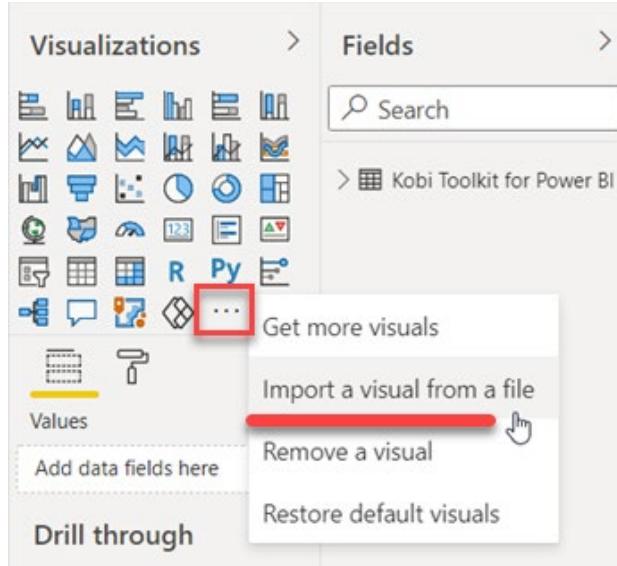
When the Navigator dialog window opens, select *Kobi Toolkit for Power BI* and click *Load*.

### Navigator



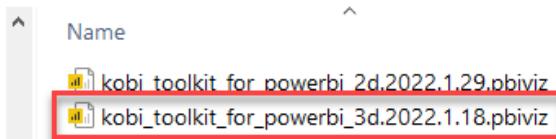
The screenshot shows the Navigator dialog in Power BI. On the left, there's a tree view showing a project folder 'rac\_basic\_sample\_project\_Default 3D\_Active Vi...' with a sub-item 'Kobi Toolkit for Power BI' selected and highlighted with a red box. On the right, there's a preview table titled 'Kobi Toolkit for Power BI' with columns: ID, Name, Category, Level, and Pbi2DGeometry. One row is visible: ID 176804, Name Floor: Generic 150mm, Category Floors, Level Level 1, and Pbi2DGeometry DwEAAB+LCAAAAAAABA. A note below says 'The data in the preview has been truncated due to size limits.' At the bottom, there are buttons for 'Load' (highlighted with a red box), 'Transform Data', and 'Cancel'.

In the left side of Power BI Desktop app is the *Visualization* panel. Click on *three dots (...)* and select '*Import a visual from a file*'.



Find the location of KobiLabs Power BI Visuals or paste in the path you copied earlier from Revit (Example: *C:\ProgramData\KobiLabs\Toolkit for Power BI*). For this first example select the *3D version*.

This PC > OS (C:) > ProgramData > KobiLabs > Toolkit for Power BI

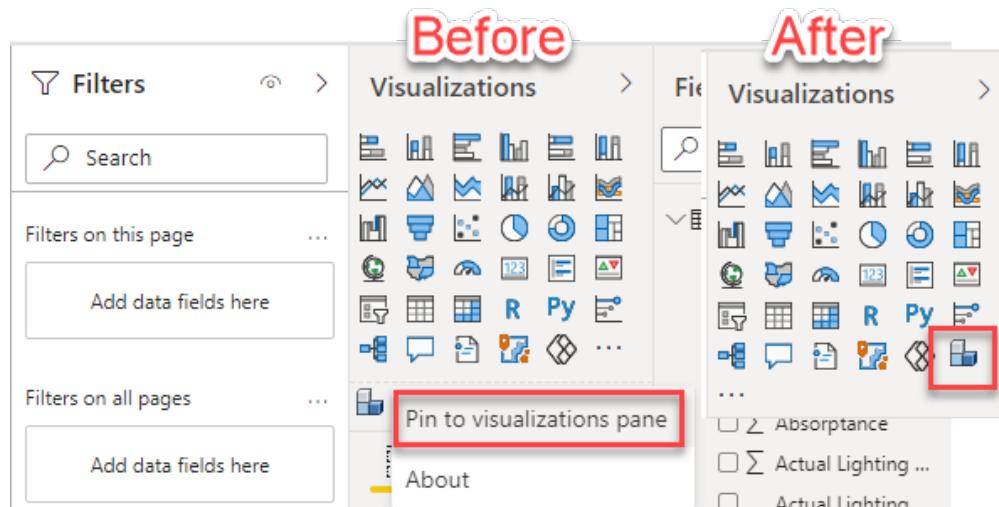


By opening this file, you can now create custom visualizations of Revit data in 3D.



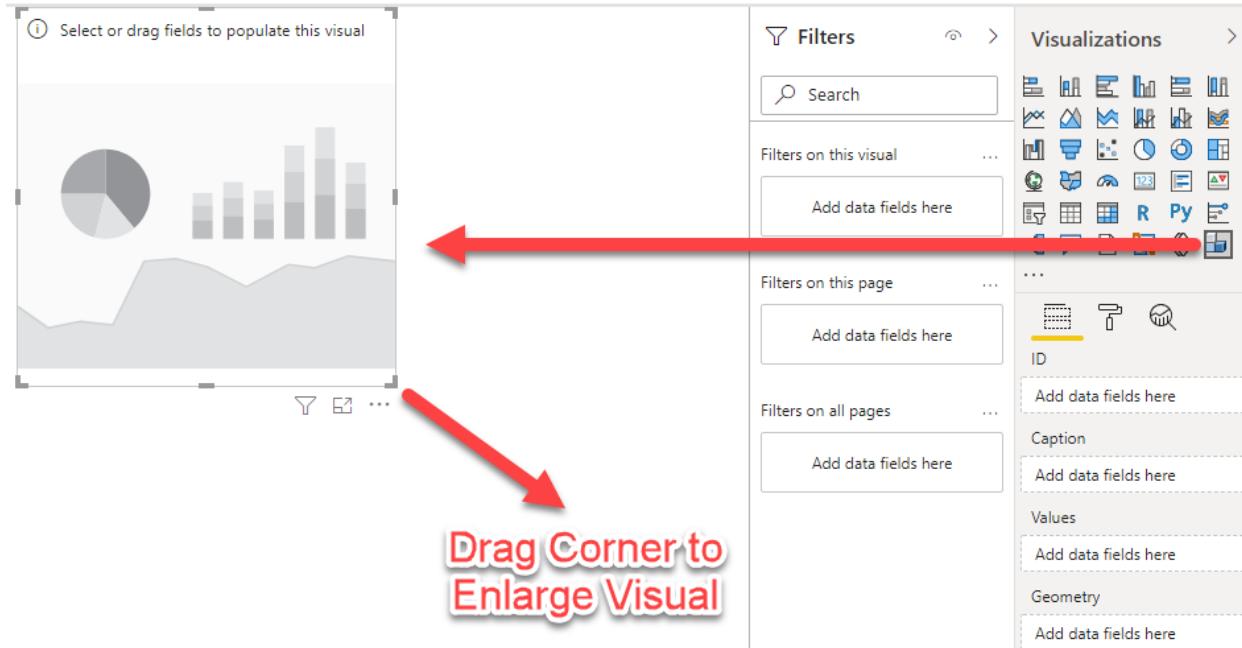
### Pin 3D Visual

Right-click on icon to *pin* the visual so it is with the other visuals the next time you open Power BI.



## 3D Model Example

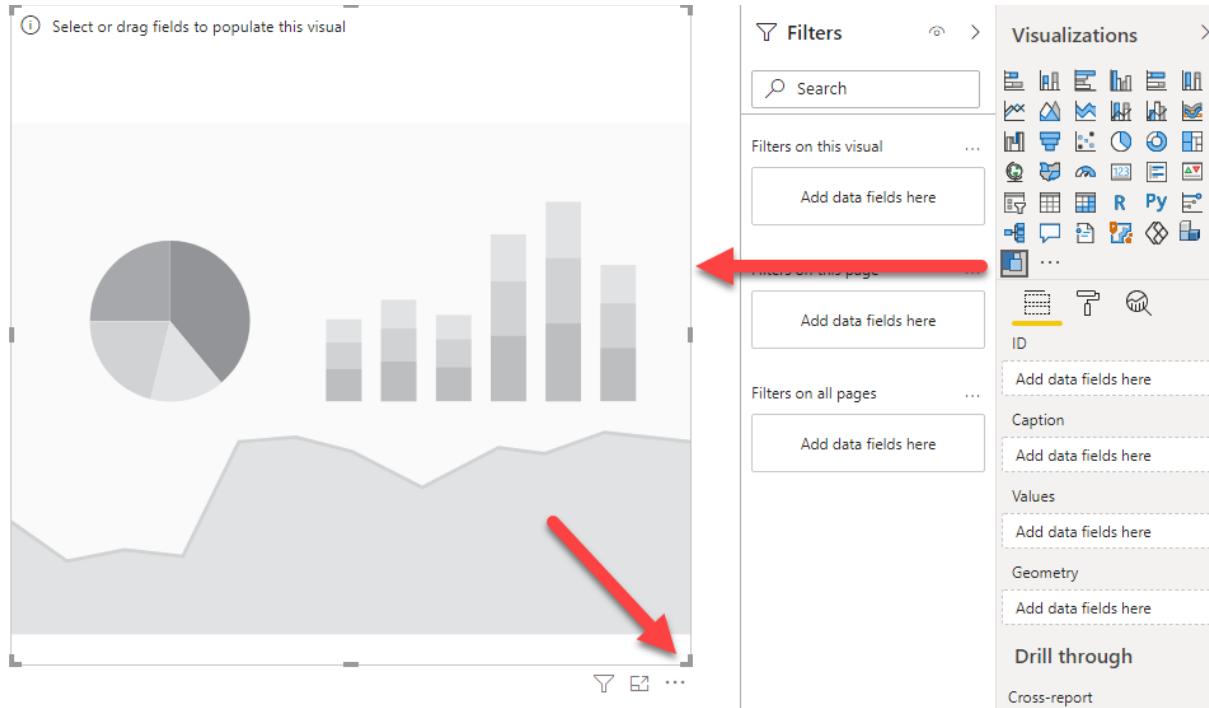
Select **3D visualization**  and that a visual is now on the dashboard. Select the corner to enlarge it so it takes up 2/3 of the dashboard.



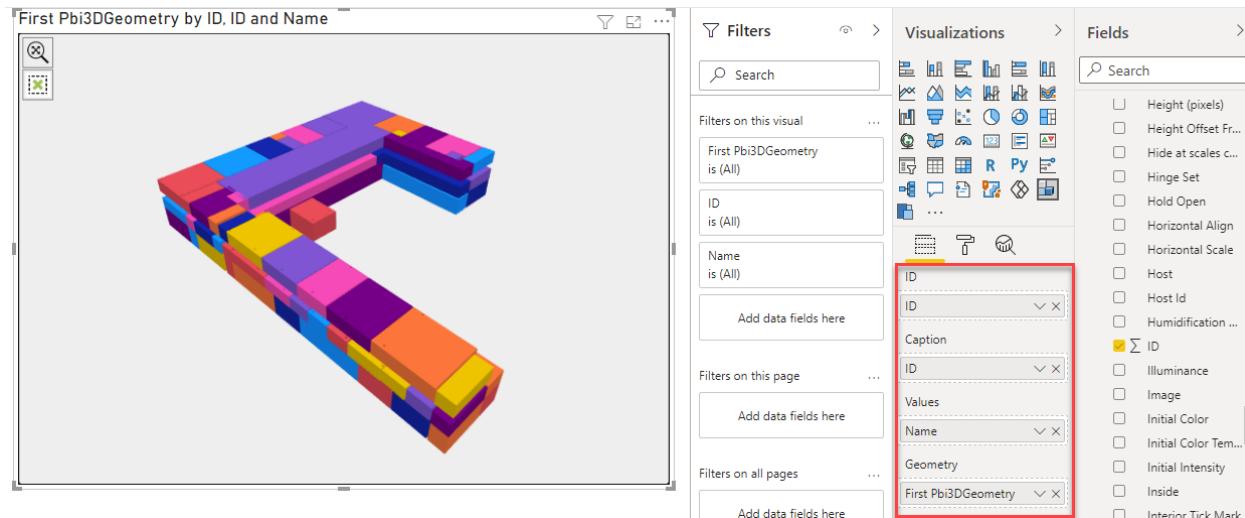
The screenshot shows the Power BI desktop interface. On the left, there is a visual area containing a pie chart and a bar chart. On the right, there is a properties pane titled "Visualizations". The "3D visualization" icon is highlighted with a red arrow. Below the visual, there is a red arrow pointing to the bottom-right corner of the visual area with the text "Drag Corner to Enlarge Visual". The properties pane includes sections for Filters, Visualizations, and various data fields like ID, Caption, Values, and Geometry.

## Add 3D Visual

Select **3D visualization**  and that a visual is now on the dashboard. Select the corner to enlarge it so it takes up 1/2 of the dashboard.



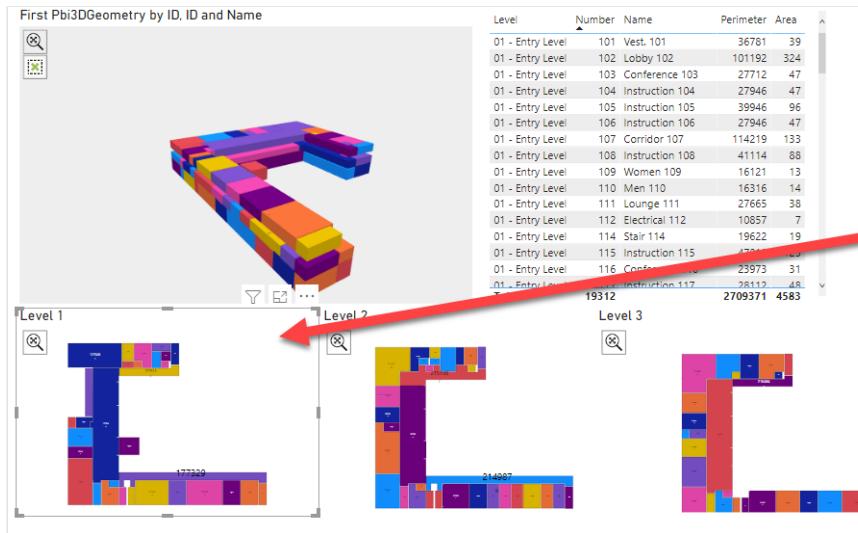
In *Fields* palette select these data fields: *ID*, *ID*, *Name*, and *Pbi3DGeometry*. Insert the data by dragging and dropping in selected rows: *ID*, *Caption*, *Values*, and *Geometry*.



## Add 2D Visual

Select *2D visualization*  and that a visual is now on the dashboard. Arrange it like the image below.

First Pbi3DGeometry by ID, ID and Name



Level	Number	Name	Perimeter	Area
01 - Entry Level	101	Vest. 101	36781	39
01 - Entry Level	102	Lobby 102	101192	324
01 - Entry Level	103	Conference 103	27712	47
01 - Entry Level	104	Instruction 104	27946	47
01 - Entry Level	105	Instruction 105	39946	96
01 - Entry Level	106	Instruction 106	27946	47
01 - Entry Level	107	Corridor 107	114219	133
01 - Entry Level	108	Instruction 108	41114	88
01 - Entry Level	109	Women 109	16121	13
01 - Entry Level	110	Men 110	16316	14
01 - Entry Level	111	Lounge 111	27665	38
01 - Entry Level	112	Electrical 112	10857	7
01 - Entry Level	114	Stair 114	19622	19
01 - Entry Level	115	Instruction 115	47016	125
01 - Entry Level	116	Conference 116	23973	31
01 - Entry Level	117	Instruction 117	28112	48
Total			19312	4583

Filters

Visualizations

Level 1      Level 2      Level 3

ID is (All)

Level is (All)

Filter type Basic filtering

Search

Select all

01 - Entry Level      31

02 - Floor      33

03 - Floor      27

Require single selection

ID Level      Caption

ID Values

Name Name

Geometry First Pbi2DGeometry

Drill through

In *Fields* palette select these data fields: *Level*, *ID*, *Name*, and *Pbi2DGeometry*. Insert the data by dragging and dropping in selected rows: *ID*, *Caption*, *Values*, and *Geometry*.

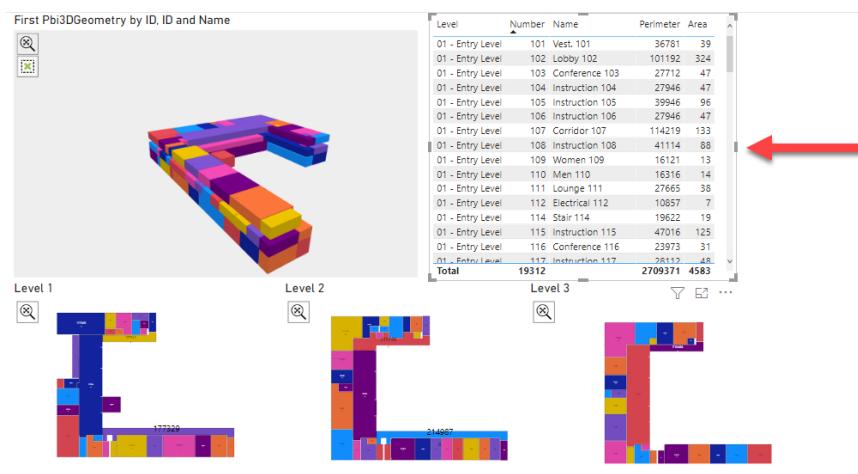
## Add Filter

Note I added a *Filter* so it would only show the *Level 1 rooms*. I then *repeated* that *process* to build a *2D visual* for *Level 2* and for *Level 3*.

## Add Table

To put some additional meaning to the visual we will add a *Table* to filter through the *different types* that are in the model. Select the *Table* visual and enlarge it if needed. Add these (2) fields to the values row: *Level*, *Number*, *Name*, *Perimeter*, and *Area*. Drag and drop to add and sort them, *top* is most *left* in the *table*.

First Pbi3DGeometry by ID, ID and Name



Level	Number	Name	Perimeter	Area
01 - Entry Level	101	Vest. 101	36781	39
01 - Entry Level	102	Lobby 102	101192	324
01 - Entry Level	103	Conference 103	27712	47
01 - Entry Level	104	Instruction 104	27946	47
01 - Entry Level	105	Instruction 105	39946	96
01 - Entry Level	106	Instruction 106	27946	47
01 - Entry Level	107	Corridor 107	114219	133
01 - Entry Level	108	Instruction 108	41114	88
01 - Entry Level	109	Women 109	16121	13
01 - Entry Level	110	Men 110	16316	14
01 - Entry Level	111	Lounge 111	27665	38
01 - Entry Level	112	Electrical 112	10857	7
01 - Entry Level	114	Stair 114	19622	19
01 - Entry Level	115	Instruction 115	47016	125
01 - Entry Level	116	Conference 116	23973	31
01 - Entry Level	117	Instruction 117	28112	48
Total			19312	4583

Filters

Visualizations

Area

Level is (All)

Name is (All)

Number is (All)

Perimeter is (All)

Add data fields here

Filters on this page

Add data fields here

Drill through

Cross-report

Off —

Keep all filters

## Sort Column

Pick the *Number* column header to sort 101 to 328.

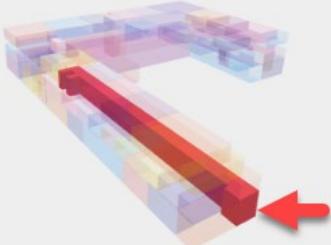
Number	Name	Perimeter	Area
101	Vest. 101	36781	39
102	Lobby 102	101192	324
103	Conference 103	27712	47
104	Instruction 104	27946	47
105	Instruction 105	39946	96
106	Instruction 106	27946	47
107	Corridor 107	114219	133
108	Instruction 108	41114	88
109	Women 109	16121	13
110	Men 110	16316	14
111	Lounge 111	27665	38
112	Electrical 112	10857	7
114	Stair 114	19622	19
115	Instruction 115	47016	125
116	Conference 116	23973	31
117	Instruction 117	28112	48
<b>19312</b>		<b>2709371</b>	<b>4583</b>

Select the different rooms in the table and notice the *3D and 2D model updates* showing those rooms. Pick the room again to unhighlight them in the model.

#### First Pbi3DGeometry by ID, ID and Name

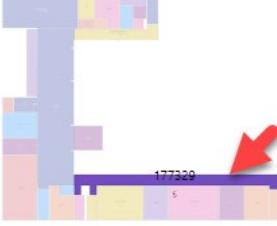
🔍

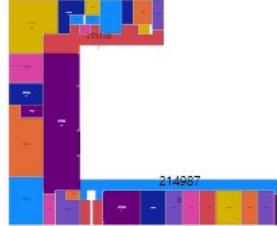
✖

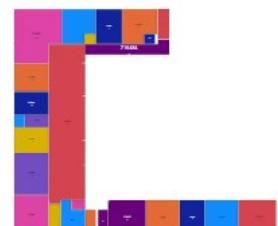


Level	Number	Name	Perimeter	Area
01 - Entry Level	101	Vest. 101	36781	39
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01 - Entry Level	104	Instruction 104	27946	47
01 - Entry Level	105	Instruction 105	39946	96
01 - Entry Level	106	Instruction 106	27946	47
<b>01 - Entry Level</b>	<b>107</b>	<b>Corridor 107</b>	<b>114219</b>	<b>133</b>
01 - Entry Level	108	Instruction 108	41114	88
01 - Entry Level	109	Women 109	16121	13
01 - Entry Level	110	Men 110	16316	14
01 - Entry Level	111	Lounge 111	27665	38
01 - Entry Level	112	Electrical 112	10857	7
01 - Entry Level	114	Stair 114	19622	19
01 - Entry Level	115	Instruction 115	47016	125
01 - Entry Level	116	Conference 116	23973	31
01 - Entry Level	117	Instruction 117	28112	48
Total	19312		2709371	4583

Level 1
Level 2
Level 3

🔍
  

  
177329

🔍
  

  
214987

🔍
  


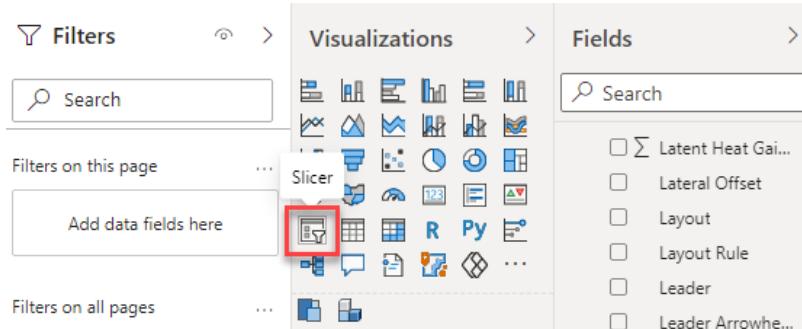
Remember, all the parameter data that you see in the Properties window in Revit are available in Power BI. It comes down to how do you want to visualize that data with a 2D or 3D model.

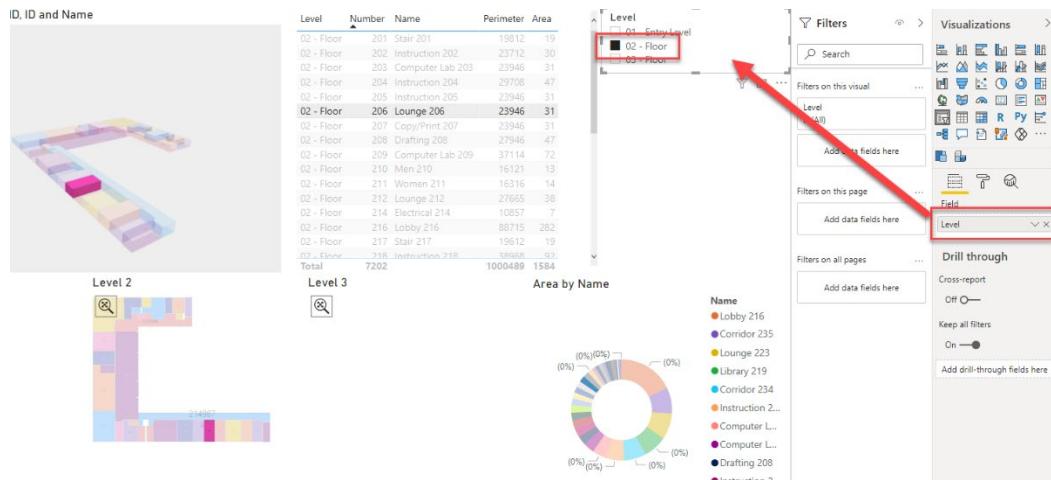
## Additional Donut Visual for Area Percentage

Add a *Donut visual* and add the *Fields: Name* and *Area*. You now can *analyze* which *rooms* are taking up the larger *percentage of area* in the *building*. By *selecting* on one of the *%* on the *pie chart highlights* it in the *model* visuals.



Make sure nothing is selected on the dashboard. On the *visualize palette* select the *Slicer* tool.





Save your newly created dashboard showing the room data in a 2D and 3D visual.

