



# ArcGIS for 3D Cities: An Introduction

Brian Sims

Dan Hedges

Thorsten Reitz

# ArcGIS for 3D Cities: An Introduction

Go 3D with your GIS

- **75 minute presentation**
- **Beginners to GIS Jedi Masters**
- **Speakers:**
  - Brian Sims
  - Dan Hedges
  - Thorsten Reitz

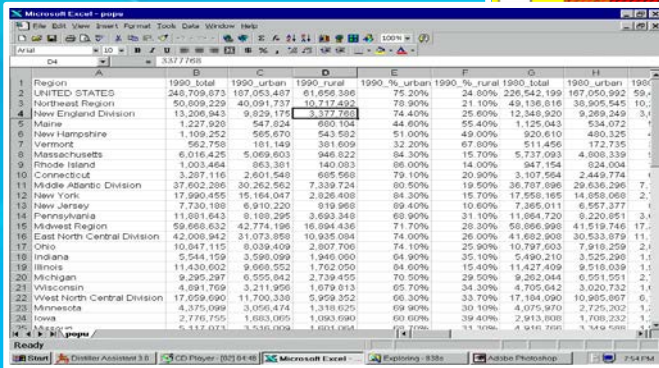
# Technical Session Overview

- **Why 3D?**
- **Introduction to 3D Cities**
- **3D-Enabling Your GIS**
- **Understanding through 3D Analytics:**
  - **Shadow Analysis**
  - **Solar Potential**
  - **View Quality**
- **Sharing Your 3D City**
- **Using + Extending the Living Atlas**
- **Wrap Up + Questions**

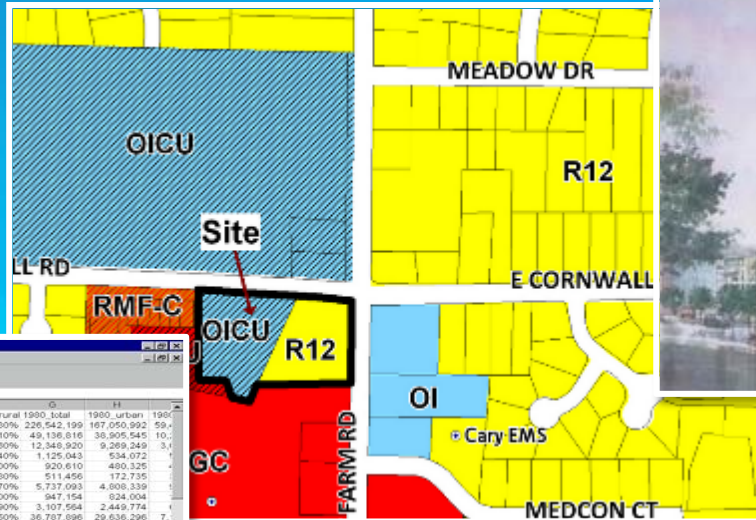
**Why 3D?**

# Why 3D?

## Traditionally we manage our cities like this...



Region	1990 total	1990 urban	1990 rural	1990 % urban	1990 % rural	1990 total	1990 urban	1990 rural
1 UNITED STATES	248,709,873	107,053,487	61,856,386	75.20%	24.80%	226,542,199	107,050,992	59,491,207
2 Northeast Region	50,809,229	40,091,737	10,717,492	78.90%	21.10%	49,136,816	38,905,548	10,231,268
3 New England Division	13,206,843	9,829,175	3,377,668	74.40%	25.60%	12,849,920	9,269,349	3,580,571
4 Maine	1,227,920	547,824	680,104	44.60%	55.40%	1,125,043	504,072	620,971
5 New Hampshire	1,109,252	595,870	513,382	51.00%	49.00%	920,810	480,325	440,485
6 Vermont	562,768	181,149	381,619	32.20%	67.80%	511,456	172,735	338,721
7 Massachusetts	6,016,425	5,069,603	946,822	84.30%	15.70%	5,737,093	4,808,339	928,754
8 Rhode Island	1,033,464	863,381	140,083	86.00%	14.00%	947,154	824,004	123,150
9 Connecticut	3,287,116	2,601,548	685,568	79.10%	20.90%	3,107,564	2,449,774	657,790
10 Middle Atlantic Division	37,602,206	30,262,562	7,339,724	80.50%	19.50%	36,787,596	29,636,296	7,151,300
11 New York	17,990,455	15,164,047	2,826,408	84.30%	15.70%	17,559,185	14,859,069	2,700,116
12 New Jersey	7,730,189	6,910,220	819,969	89.40%	10.60%	7,365,011	6,557,377	807,634
13 Pennsylvania	11,851,643	8,188,295	3,663,348	69.00%	31.00%	11,064,720	8,220,951	2,843,769
14 Midwest Region	59,669,632	42,774,196	16,894,436	71.70%	28.30%	56,866,998	41,519,746	15,347,252
15 East North Central Division	42,008,942	31,073,959	10,934,984	74.00%	26.00%	41,662,908	30,533,979	11,128,929
16 Ohio	10,847,115	8,039,409	2,807,706	74.10%	25.90%	10,797,603	7,918,259	2,879,344
17 Indiana	5,544,159	3,598,099	1,946,060	64.90%	35.10%	5,490,210	3,525,290	1,964,920
18 Illinois	11,430,602	9,668,552	1,762,050	84.60%	15.40%	11,427,409	9,518,039	1,909,370
19 Michigan	9,295,297	6,555,842	2,739,455	70.50%	29.50%	9,262,044	6,551,551	2,710,493
20 Wisconsin	4,891,769	3,211,956	1,679,813	65.70%	34.30%	4,705,642	3,020,732	1,684,910
21 West North Central Division	17,659,690	11,700,338	5,959,352	66.30%	33.70%	17,184,690	10,995,807	6,188,883
22 Minnesota	4,375,099	3,056,474	1,318,625	69.90%	30.10%	4,875,870	3,275,202	1,600,668
23 Iowa	2,776,755	1,683,065	1,093,690	60.60%	39.40%	2,913,808	1,708,232	1,205,576
24 Missouri	5,117,071	3,536,059	1,581,054	69.10%	30.90%	4,916,709	3,348,000	1,568,709



Why 3D?

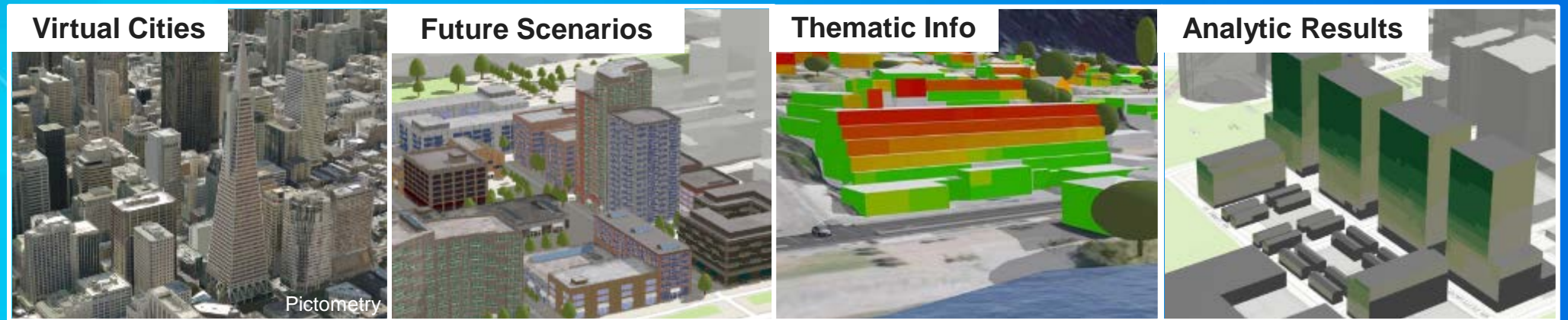
Yet cities look like this



## Why 3D?

Across all industries ArcGIS users are going 3D to:

- Visualize within the context of the real world
- Present with more realism and remove interpretation



## Why 3D?

**Across all industries ArcGIS users are going 3D to:**

- Visualize within the context of the real world
- Present with more realism and remove interpretation
- **Communicate with non-technical audiences**



## Why 3D?

### Across all industries ArcGIS users are going 3D to:

- Visualize within the context of the real world
- Present with more realism and remove interpretation
- Communicate with non-technical audiences
- **Drive more informed decisions faster**

The background features a vibrant blue gradient. On the left side, there are several overlapping geometric shapes: a large purple triangle pointing upwards, a yellow triangle pointing downwards, and a dark purple triangle pointing to the right. These shapes are layered, creating a sense of depth. The text 'Introduction to 3D Cities' is centered in the upper half of the image in a white, bold, sans-serif font.

# Introduction to 3D Cities

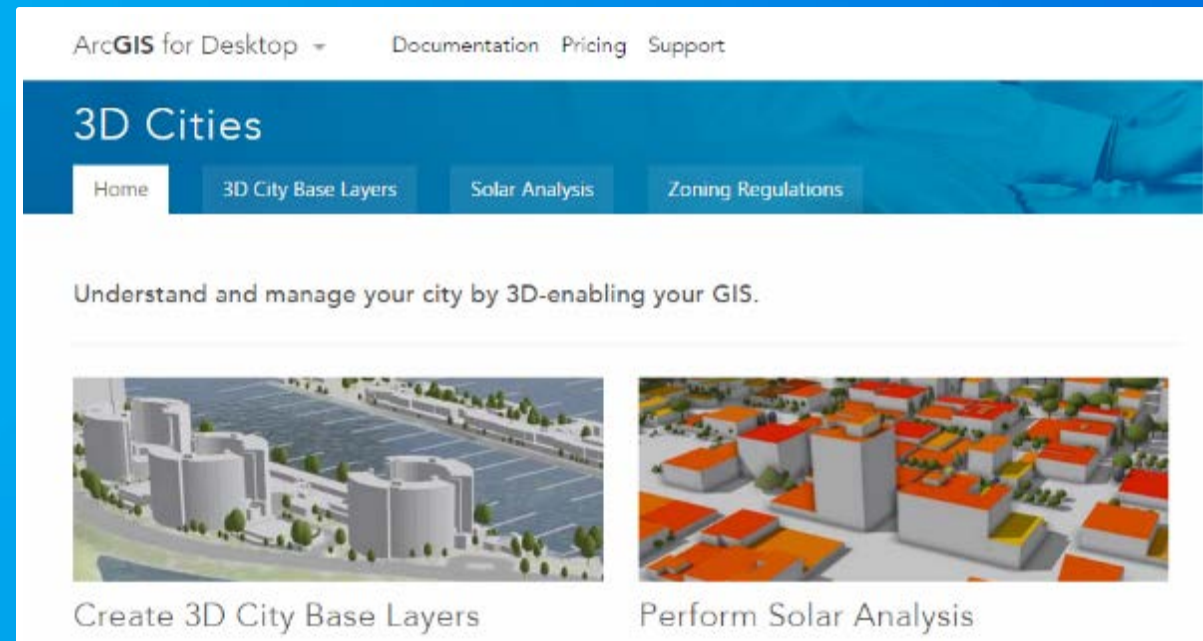
# Helping you go 3D with your GIS

Introduction to ArcGIS for 3D Cities

## Collection of best practices workflow:

- Step-by-step workflows
- Tools
- Sample data
- Example scenes

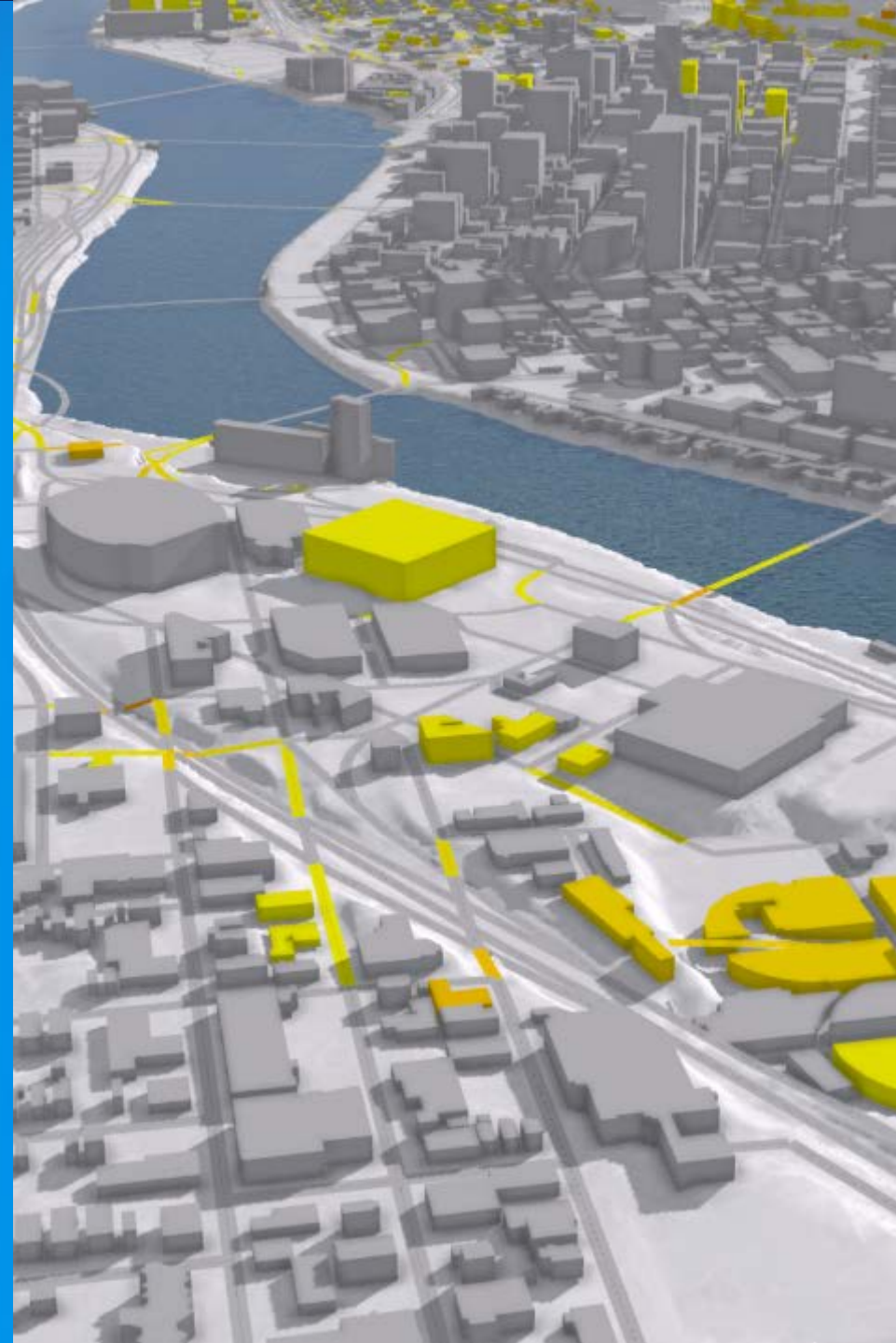
<http://esriurl.com/3DCities>



The screenshot shows the ArcGIS 3D Cities website. At the top, there is a navigation bar with links for 'ArcGIS for Desktop', 'Documentation', 'Pricing', and 'Support'. Below this is a dark blue header with the text '3D Cities' and a navigation menu with buttons for 'Home', '3D City Base Layers', 'Solar Analysis', and 'Zoning Regulations'. The main content area features the headline 'Understand and manage your city by 3D-enabling your GIS.' Below the headline are two featured sections: 'Create 3D City Base Layers' with an image of a modern city skyline, and 'Perform Solar Analysis' with an image of a city street view showing solar panel placement on buildings.

# 3D City Base Layers

Dan Hedges



# 3D City Base Layers

Buildings

3D Buildings

Multiple Levels Of Detail

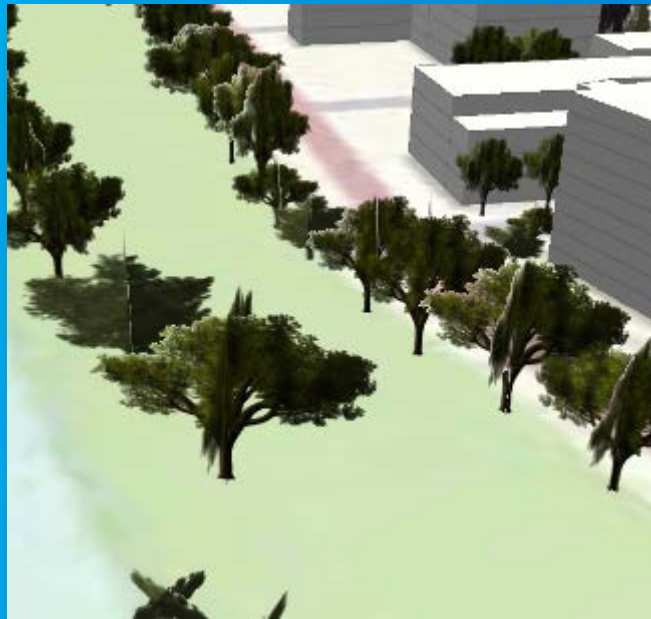


# 3D City Base Layers

Trees

3D Buildings

Trees



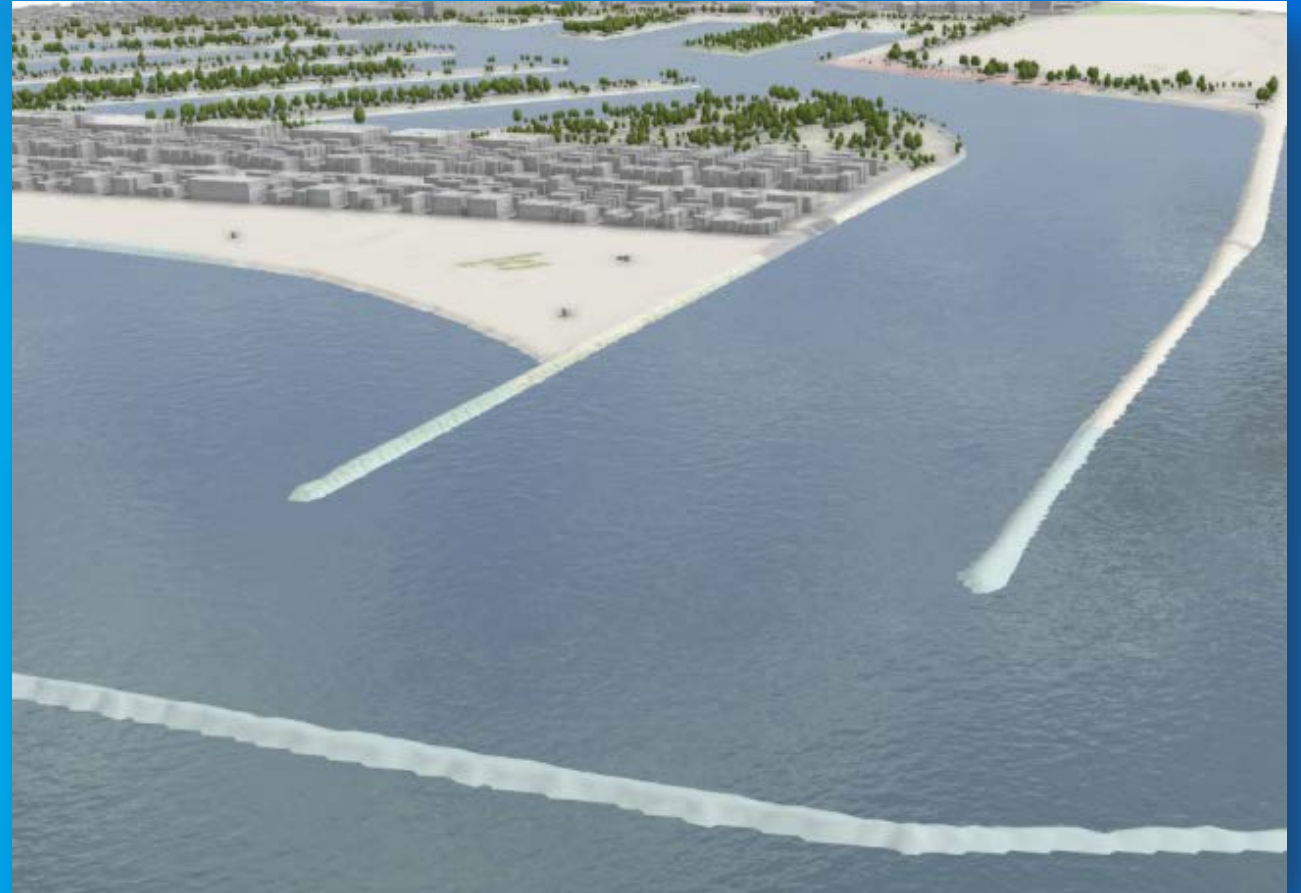
# 3D City Base Layers

Water Bodies

3D Buildings

Trees

Water Bodies



# 3D City Base Layers

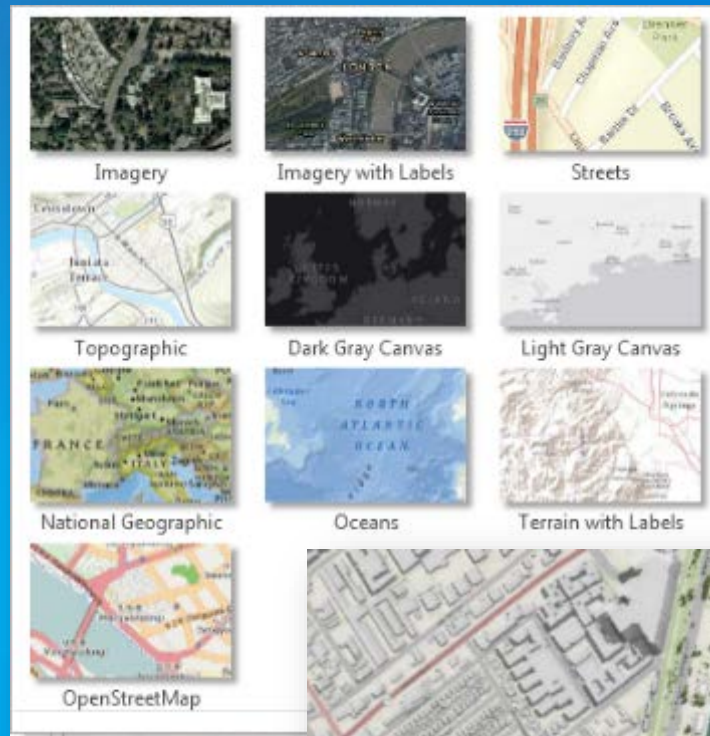
Basemap

3D Buildings

Trees

Water Bodies

Basemap





# 3D City Base Layers

Terrain

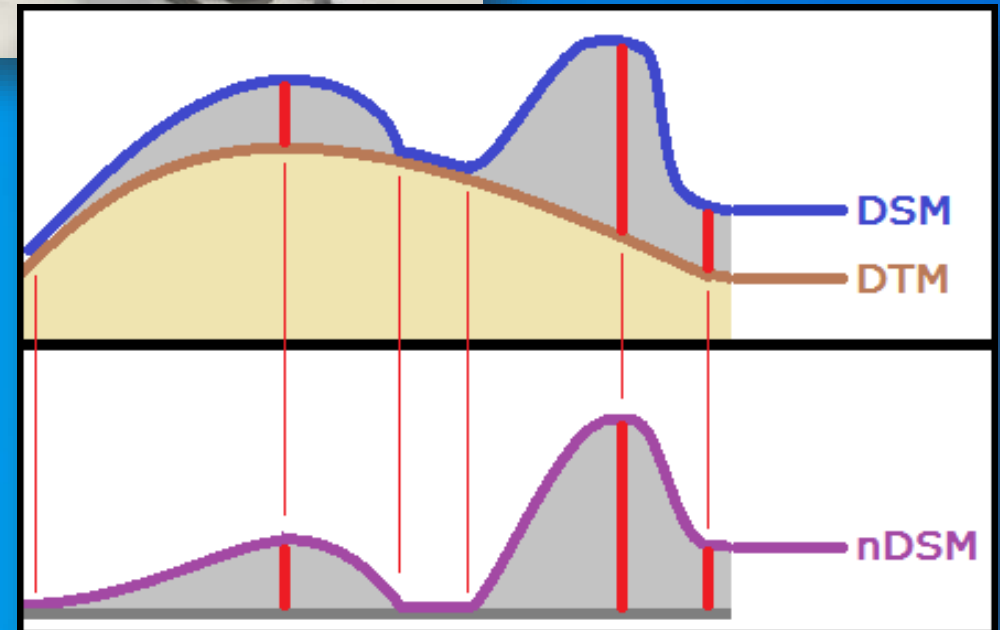
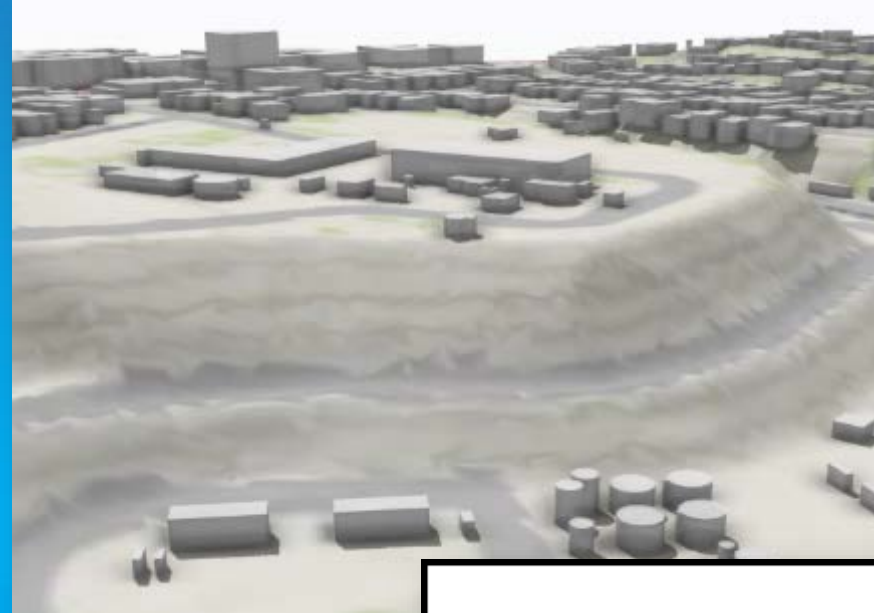
3D Buildings

Trees

Water Bodies

Basemap

Terrain



# 3D City Base Layers

Designed to support the understanding of cities

3D Buildings



Trees



Water Bodies



Basemap

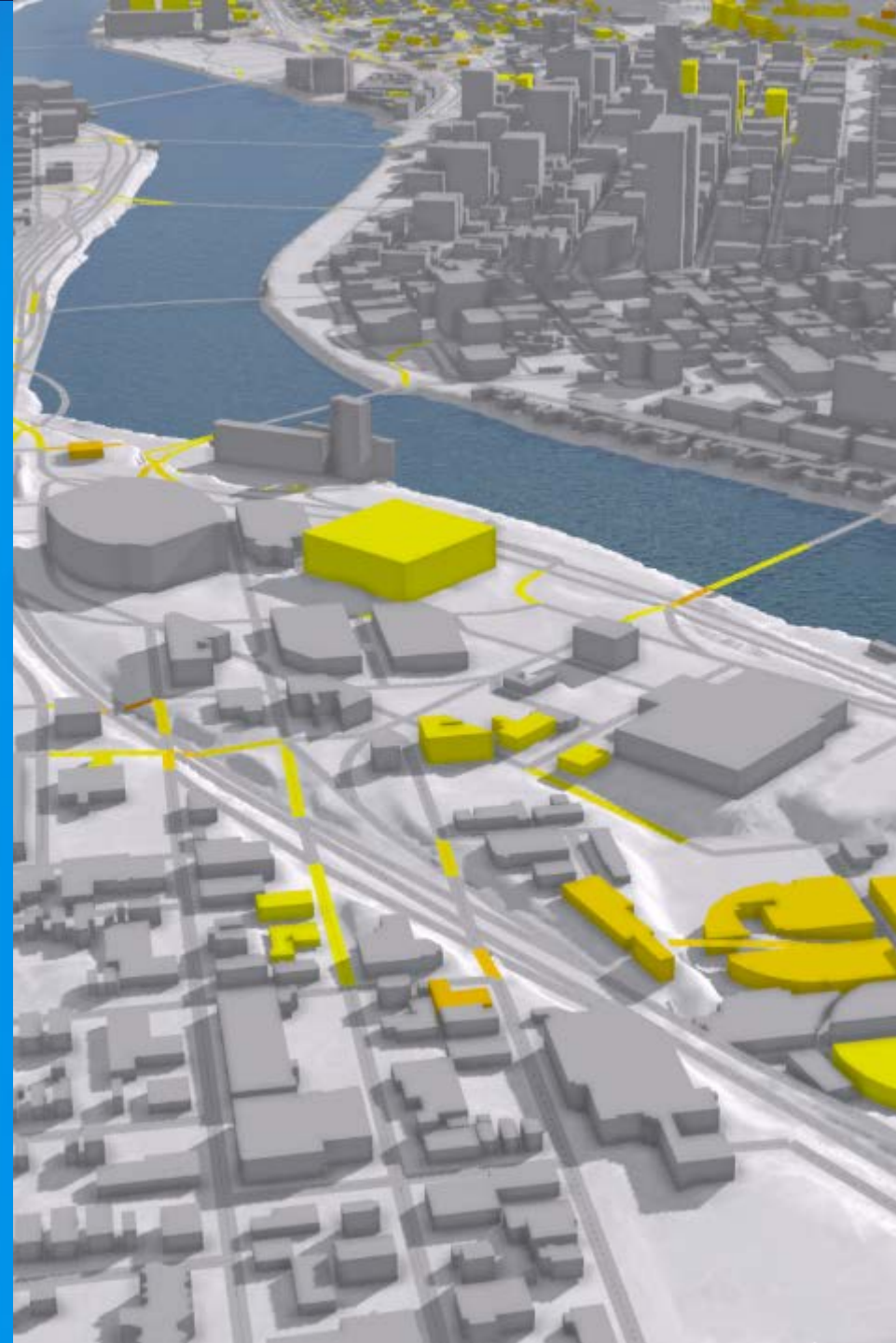


Terrain



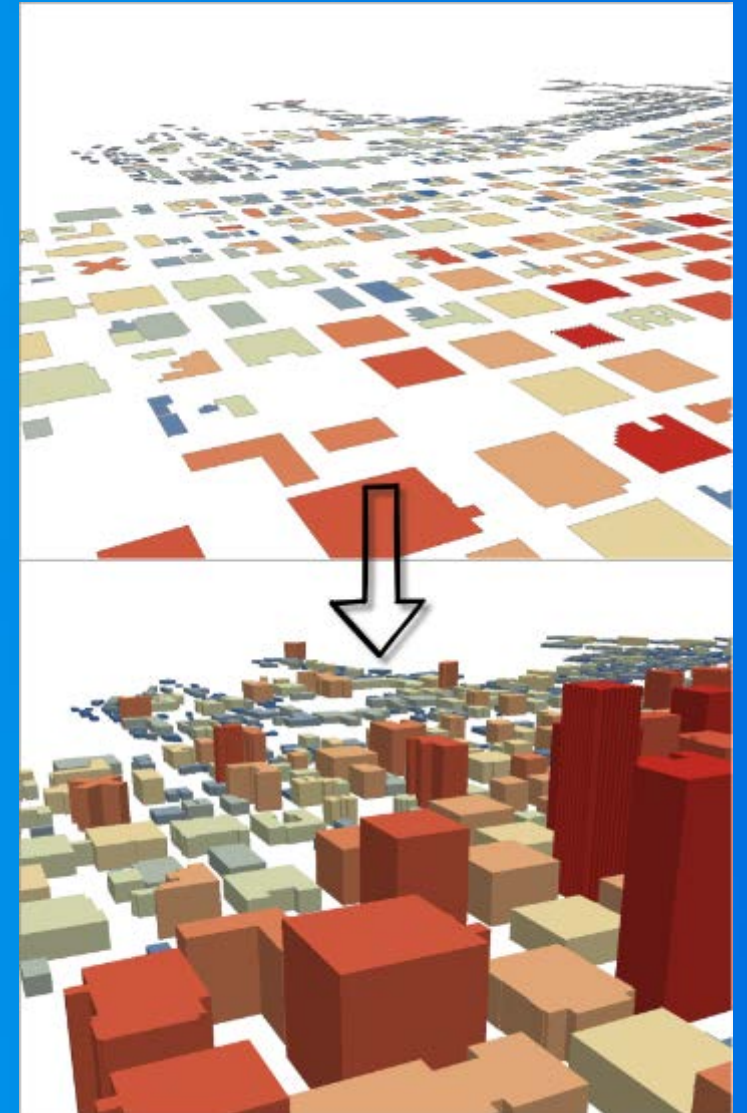
# Create 3D City Base Layers

Dan Hedges



# Procedural Rules

- Attribute-driven 3D feature creation and texturing
  - Buildings
  - Zoning envelopes
  - 3D Measurement symbols



# Base Layer Editing Video Demo



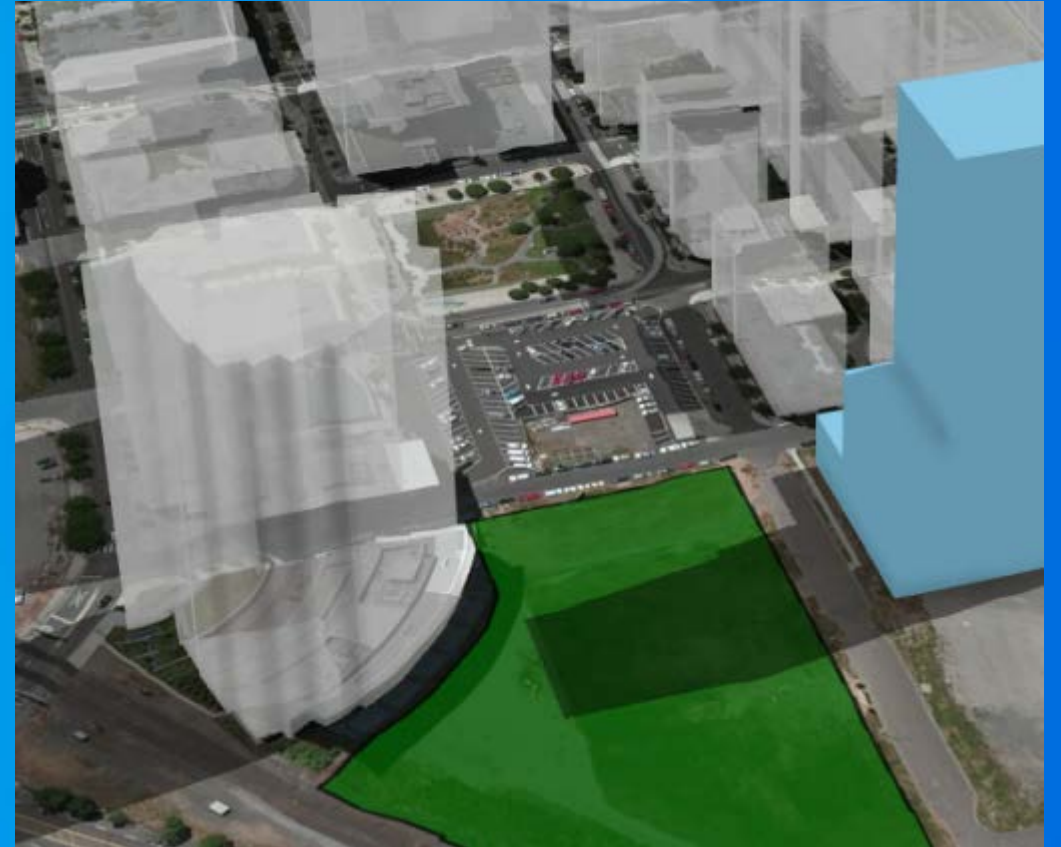


# Analytics: Shadow Impact

Dan Hedges

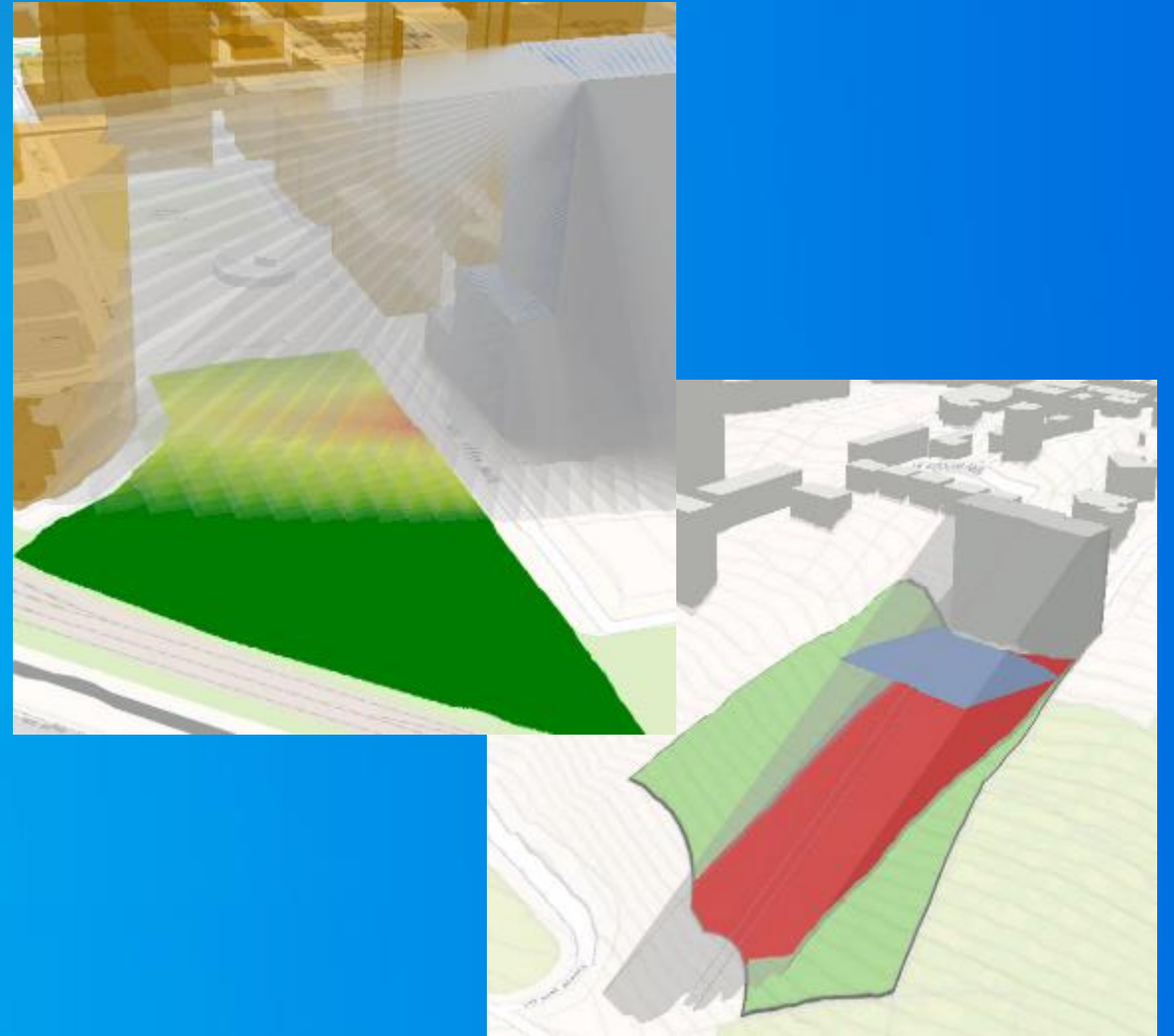
# 3D Shadow Analysis

- **Impacts of building shadows**
  - **Detracts sunlight from public spaces**
  - **Reduces solar potential**
  - **Heat reduction effects on impervious surfaces**
- **Importance for planning**
  - **Adhere to regulations**
  - **Maximize positive effects of sunlight and shading**
  - **Communicate potential changes to public**



# 3D Shadow Analysis

- Create “shadow fan” maps
  - Shows time per day spent in shadow
  - Takes terrain variation into account
- Summarize results
  - Determine net shadow impact ( $m^2hrs$ )
  - Percent change





# Shadow Web Scene



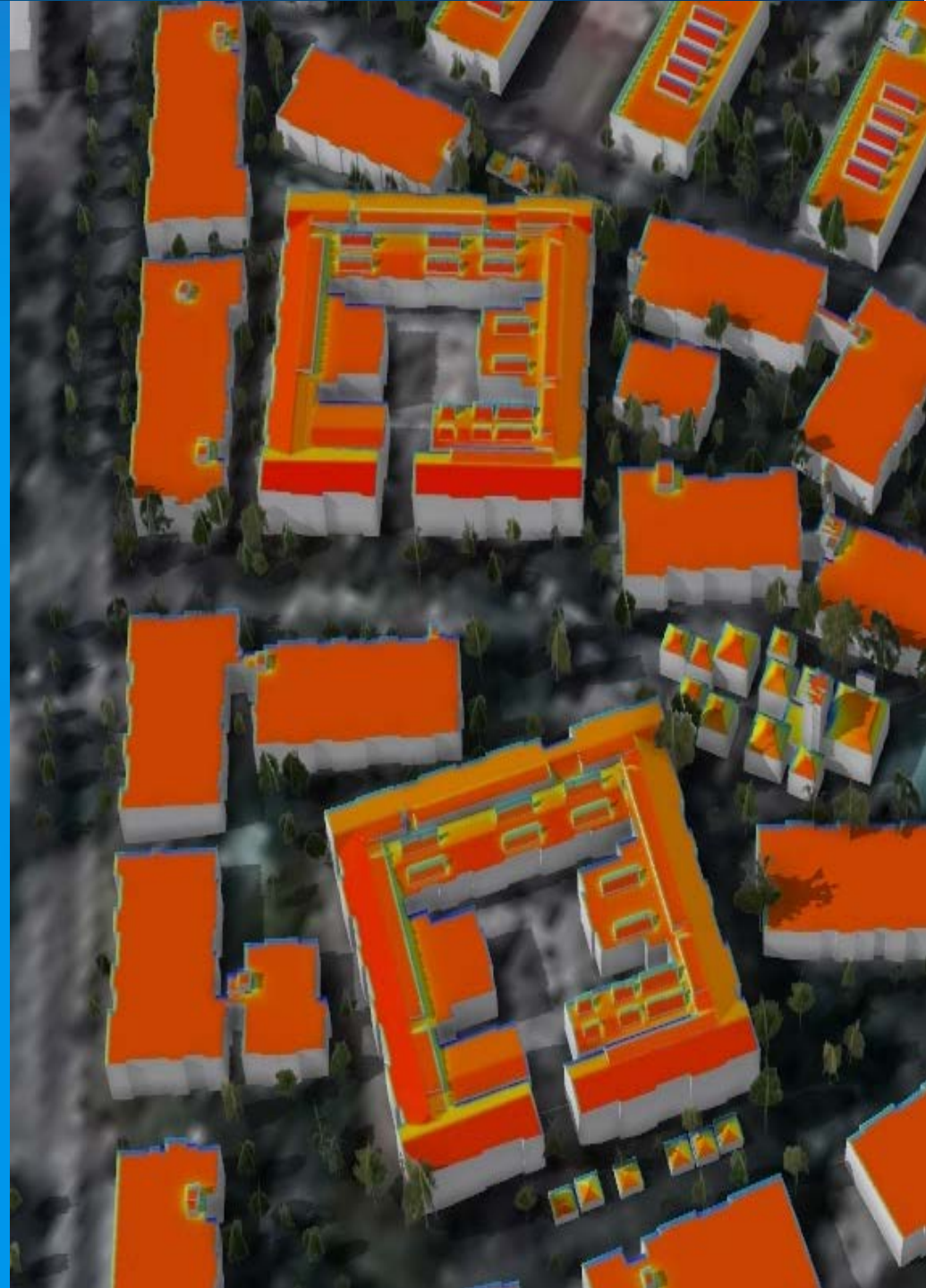


# Analytics: Solar Potential

Dan Hedges

# Solar Potential Analysis

- **Why**
  - Evaluate solar potential of built environment
  - Offset carbon impact of new development
  - Set rules for future urban design proposals



# Solar Potential Analysis

- **How**

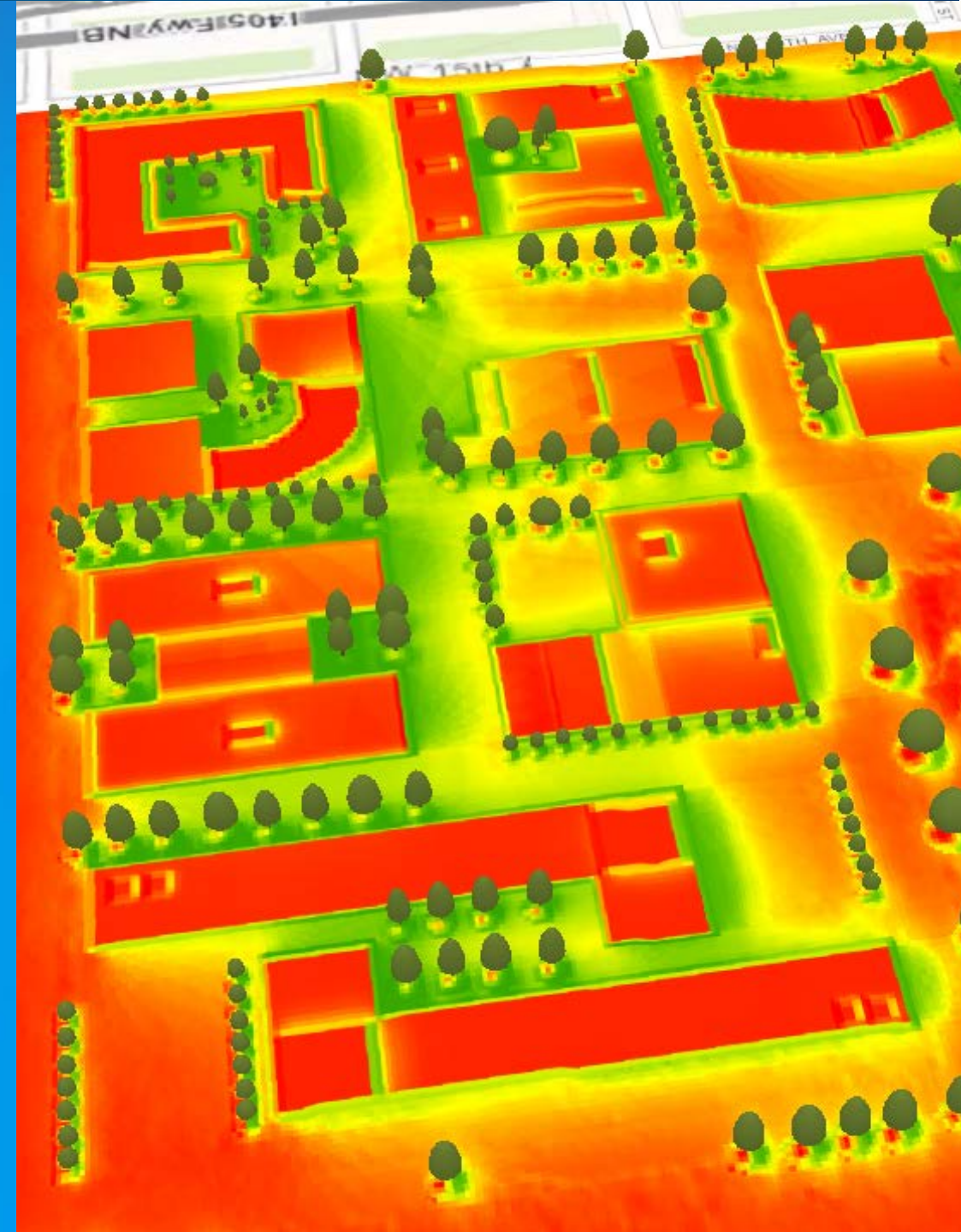
- Determine best-fit atmospheric parameters
- Create calculation surfaces
- Apply radiation output to roof faces
- Evaluate output
  - Find most suitable solar locations
  - Evaluate impact of high-rise development



# Solar Potential Analysis

- **How**

- Determine best-fit atmospheric parameters
- **Create radiation surface**
- Apply radiation output to roof faces
- Evaluate output
  - Find most suitable solar locations
  - Evaluate impact of high-rise development



# Solar Potential Analysis

- **How**

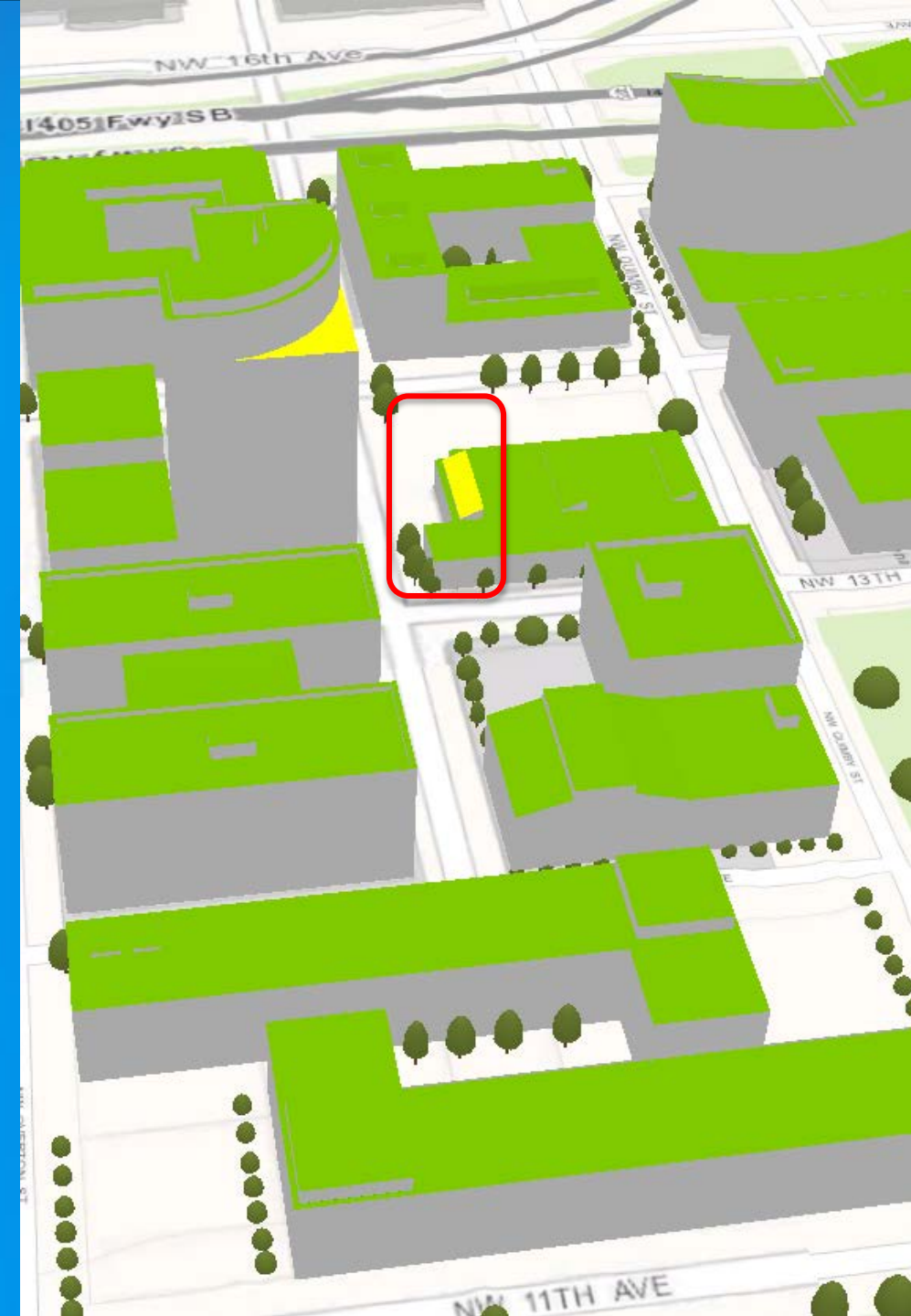
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# Solar Potential Analysis

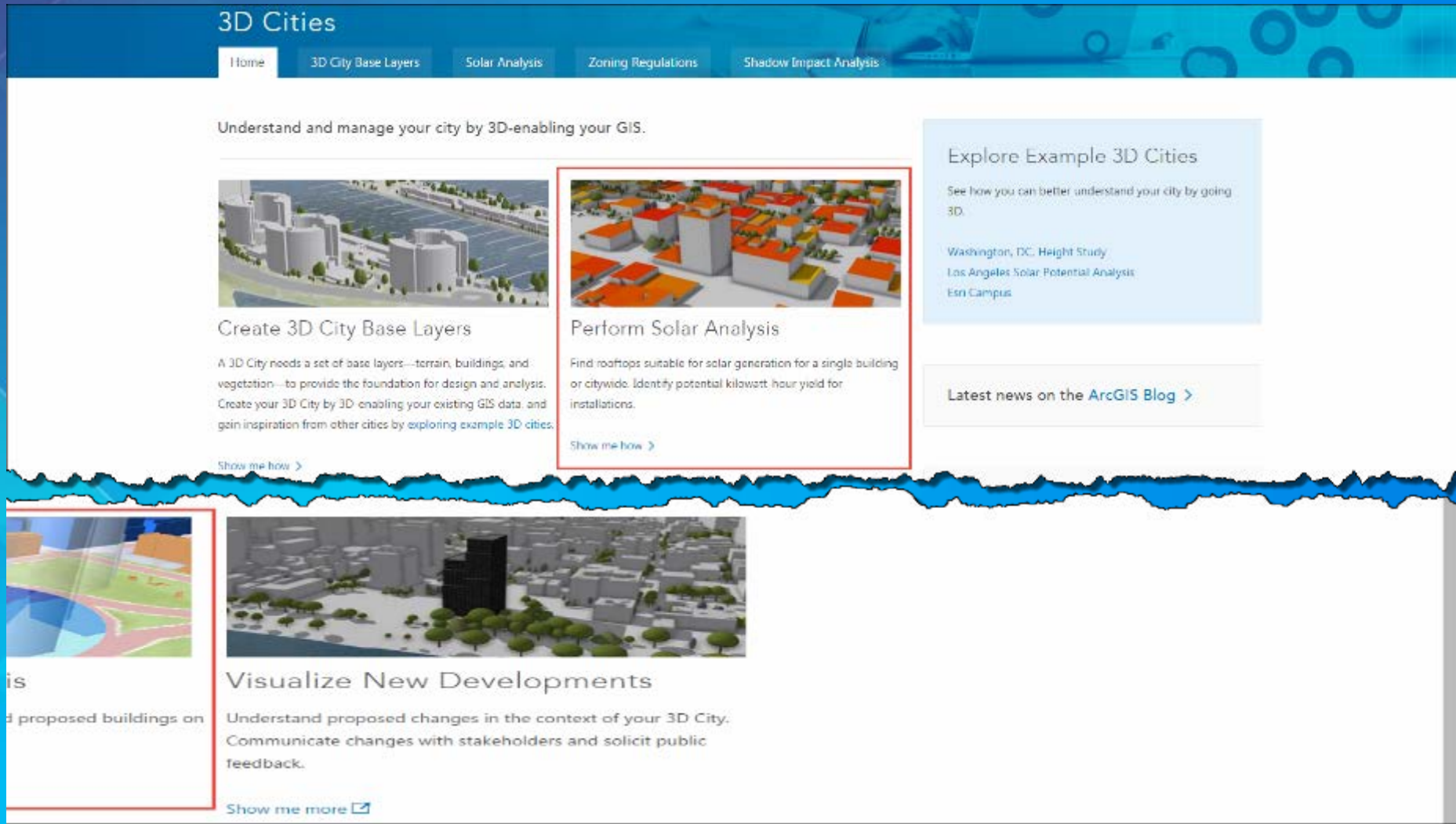
- **How**

- Determine best-fit atmospheric parameters
- Create radiation surface
- Apply radiation output to roof faces
- Evaluate output
  - Find most suitable solar locations
  - Evaluate impact of high-rise development



# Analytics Workflows

3D Cities Workflows: <http://esriurl.com/3DCities>



The screenshot displays the '3D Cities' website interface. At the top, there is a navigation bar with the title '3D Cities' and several menu items: 'Home', '3D City Base Layers', 'Solar Analysis', 'Zoning Regulations', and 'Shadow Impact Analysis'. Below the navigation bar, a main heading reads 'Understand and manage your city by 3D-enabling your GIS.' The page features several content cards:

- Create 3D City Base Layers:** Includes an image of a 3D city model and text explaining that base layers (terrain, buildings, vegetation) provide the foundation for design and analysis. It encourages users to create their 3D City by enabling existing GIS data and to gain inspiration from other cities. A 'Show me how >' link is present.
- Perform Solar Analysis:** Includes an image of a 3D city model with solar panels on rooftops. Text describes finding rooftops suitable for solar generation for a single building or citywide, and identifying potential kilowatt-hour yield for installations. A 'Show me how >' link is present.
- Explore Example 3D Cities:** A light blue box containing the text 'See how you can better understand your city by going 3D.' and a list of examples: 'Washington, DC, Height Study', 'Los Angeles Solar Potential Analysis', and 'Esri Campus'.
- Latest news on the ArcGIS Blog >** A button with a right-pointing arrow.
- Visualize New Developments:** Includes an image of a 3D city model with a prominent black building. Text explains understanding proposed changes in the context of the 3D City and communicating changes with stakeholders for public feedback. A 'Show me more ' link is present.

There are also some partially visible cards on the left side of the page, one showing a 3D map and another with the text 'is' and 'd proposed buildings on'.





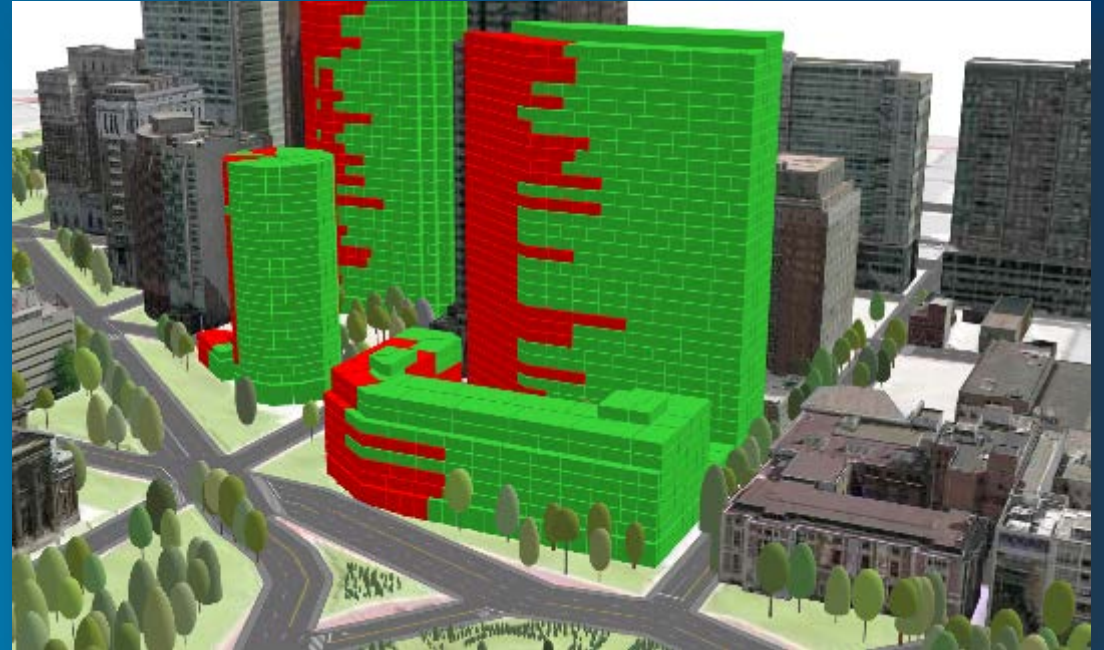
# View Quality

Thorsten Reitz

# View Quality Analysis - Main Applications



Visual Impact of changes



Value Assessment of Real Estate

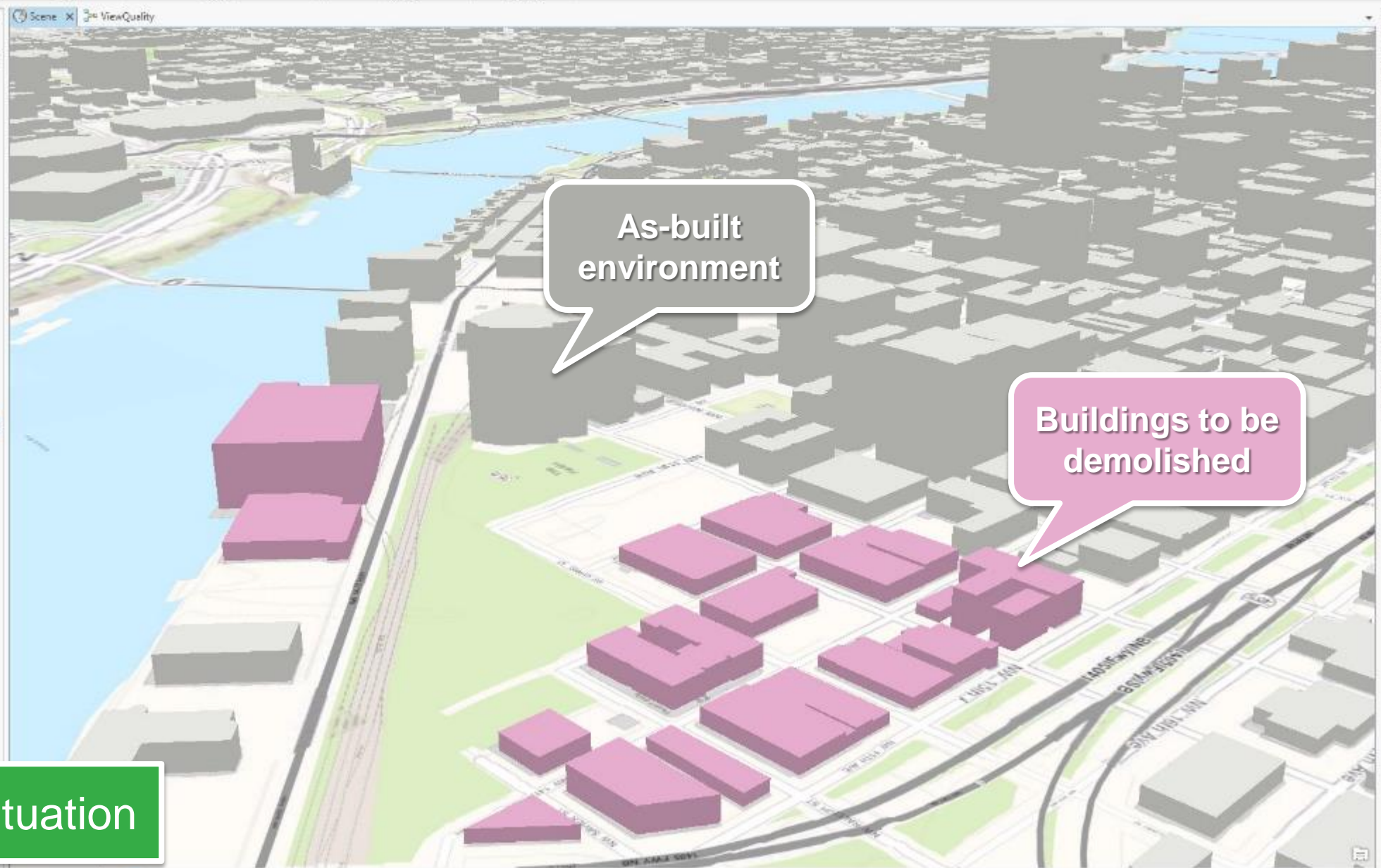
Contents

Scene X ViewQuality

Search

Drawing Order

- Scene
  - 3D Layers
    - ExistingBuilding2
    - ObstructingBuildings
    - RiverPoints
    - River multipatch
    - ExistingBuildingsViewQuality
    - ExistingBuildingsRest
    - ExistingBuildingsToBeDemolished
    - DevB
    - DevA
    - Results
  - 2D Layers
    - DEM.tif\_Band\_1
      - Value
      - 1045.69
      - 69.0911
    - Topographic



As-built environment

Buildings to be demolished

# 1. Current Situation



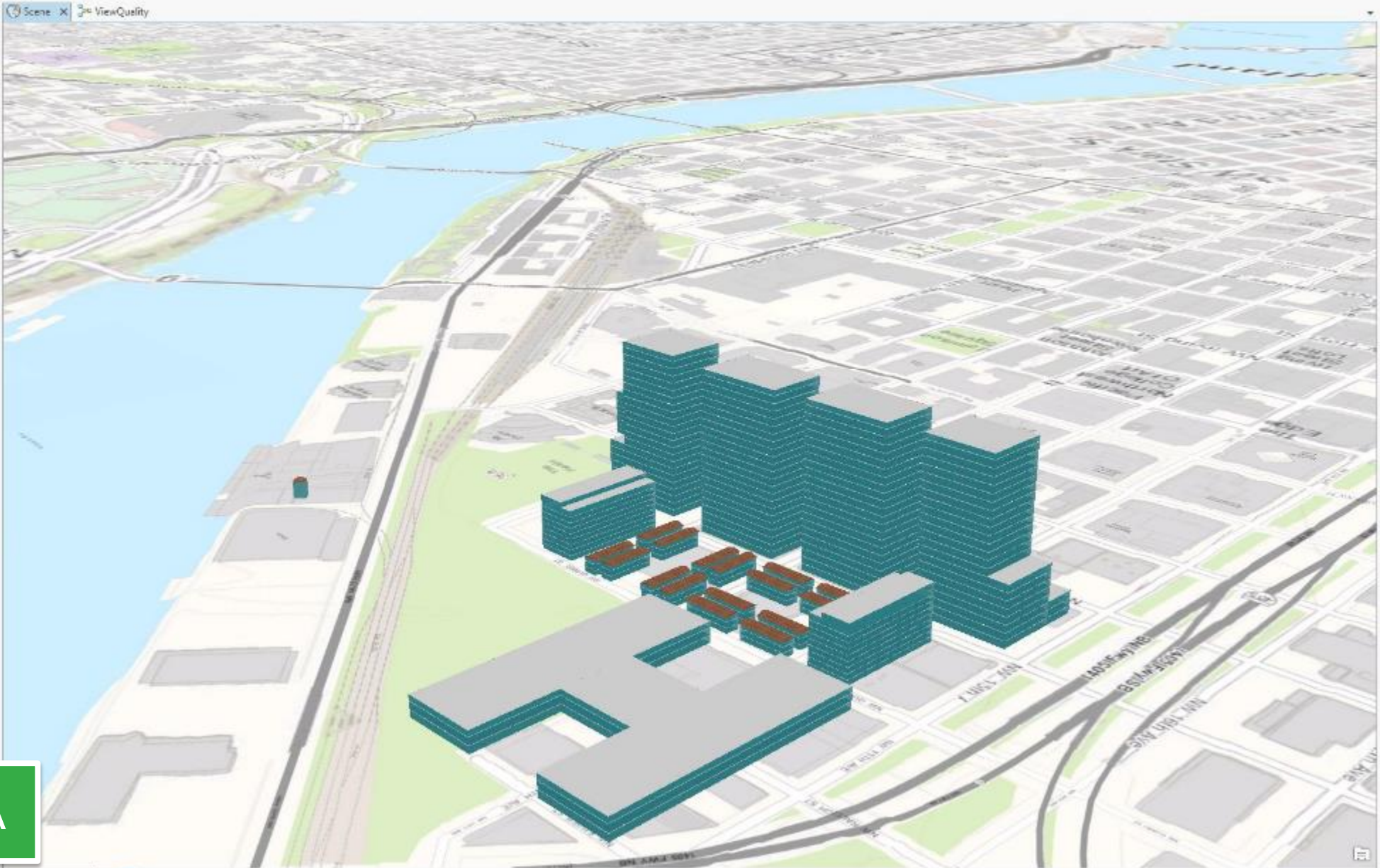
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    - Results
  - 2D Layers
    - DEM.tif\_Band\_1
      - Value: 1045.69 to -69.0911
    - Topographic



Project | Symbols | Attributes | Geoprocessing | Modify Features | Job Status | Bookmarks

# 2. Proposal A

PROJECT MAP INSERT ANALYSIS VIEW EDIT SHARE APPEARANCE LABELING DATA

Clipboard: Cut, Copy, Paste, Explore, Bookmarks, Navigate

Layer: Basemap, Add Data, Add Preset

Selection: Select, Select By Attributes, Select By Location, Clear

Inquiry: Infographics, Measure, Locate

Labeling: Pause, View Unplaced, More

Contents

Scene x ViewQuality

Search

Drawing Order

- Scene
  - 3D Layers
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    - ObstructingBuildings
    - RiverPoints
    - River multipatch
    - ExistingBuildingsViewQuality
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    - ExistingBuildingsToBeDemolished
    - DevB
    - DevA
    - Results
    - 2D Layers
      - DEM.tif\_Band\_1
        - Value: 1045.69 to -69.0911
        - Topographic



Project | Symbols | Attributes | Geoprocessing | Modify Features | Job Status | Bookmarks

3. Proposal B

PROJECT MAP INSERT ANALYSIS VIEW EDIT SHARE APPEARANCE LABELING DATA

Clipboard: Cut, Copy, Paste, Explore, Navigate, Bookmarks

Layer: Basemap, Add Data, Add Preset

Selection: Select, Select By Attributes, Select By Location, Clear

Inquiry: Infographics, Measure, Locate

Labeling: Attributes, View Unplaced, More, Labeling

Contents

Scene x ViewQuality

3D Layers

- ExistingBuilding2
- ObstructingBuildings
- RiverPoints
- River multipatch
- ExistingBuildingsViewQuality
- ExistingBuildingsRest
- ExistingBuildingsToBeDemolished
- DevB
- DevA
- Results

2D Layers

- DEM.tif\_Band\_1  
Value: 1045.69 to -69.0911
- Topographic



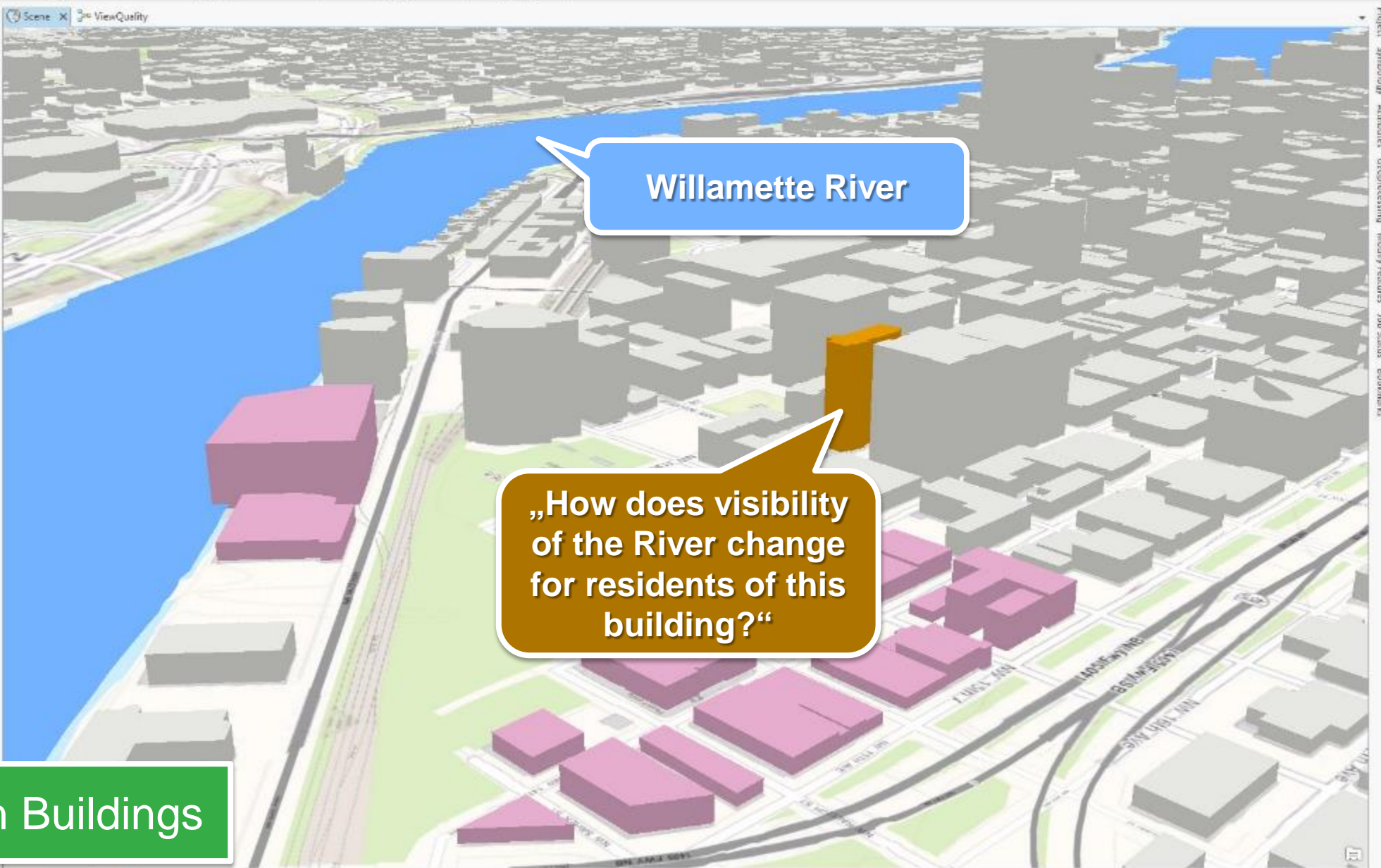
4. Proposal B in Context

Contents

Scene x ViewQuality

Scene

- 3D Layers
  - ExistingBuilding2
  - ObstructingBuildings
  - RiverPoints
  - River multipatch
  - ExistingBuildingsViewQuality
  - ExistingBuildingsRest
  - ExistingBuildingsToBeDemolished
  - DevB
  - DevA
  - Results
- 2D Layers
  - DEM.tif\_Band\_1  
Value: 1045.69 to -69.0911
  - Topographic



Willamette River

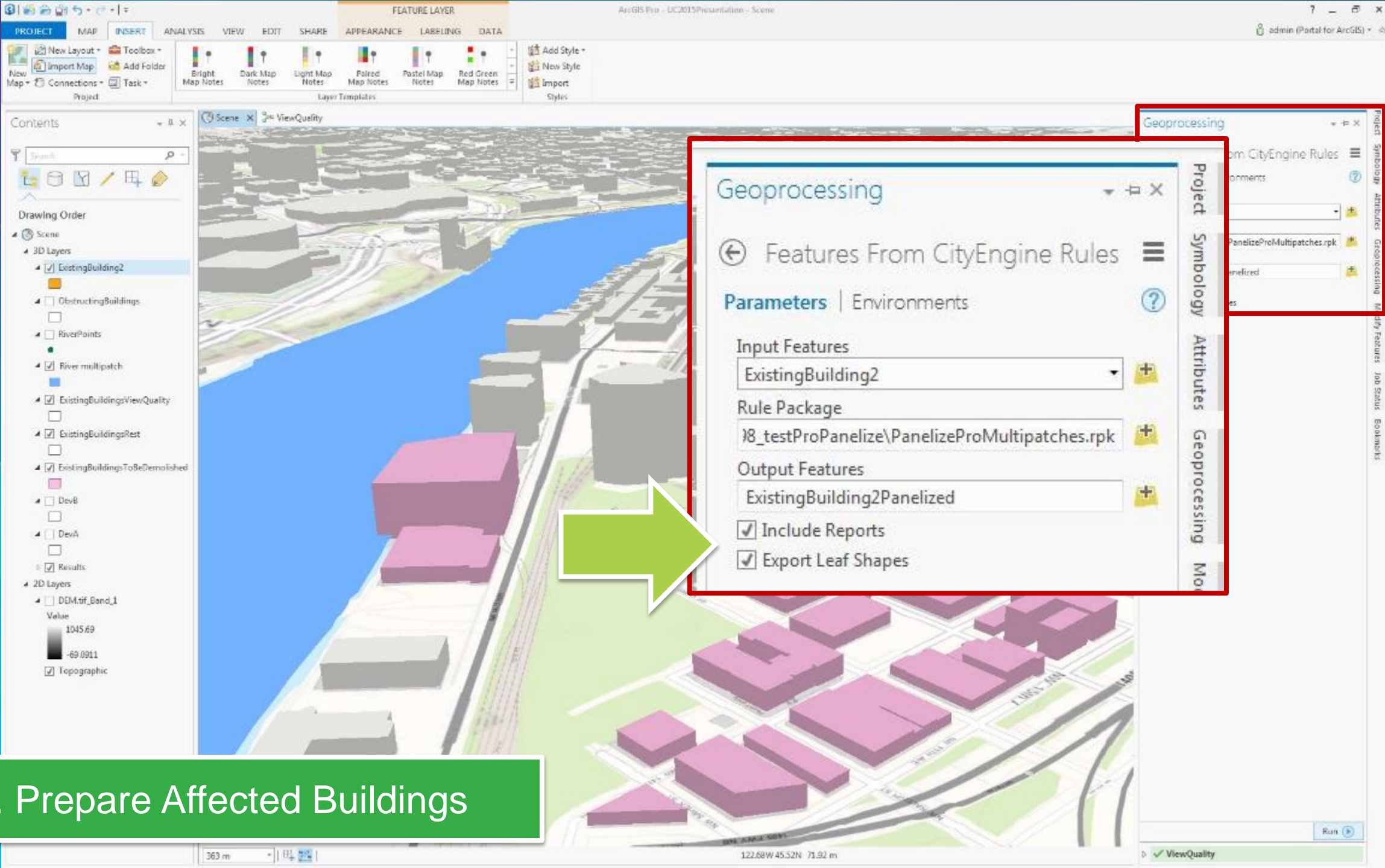
„How does visibility of the River change for residents of this building?“

5. Impacts on Buildings

# Lines of Sight - Terms

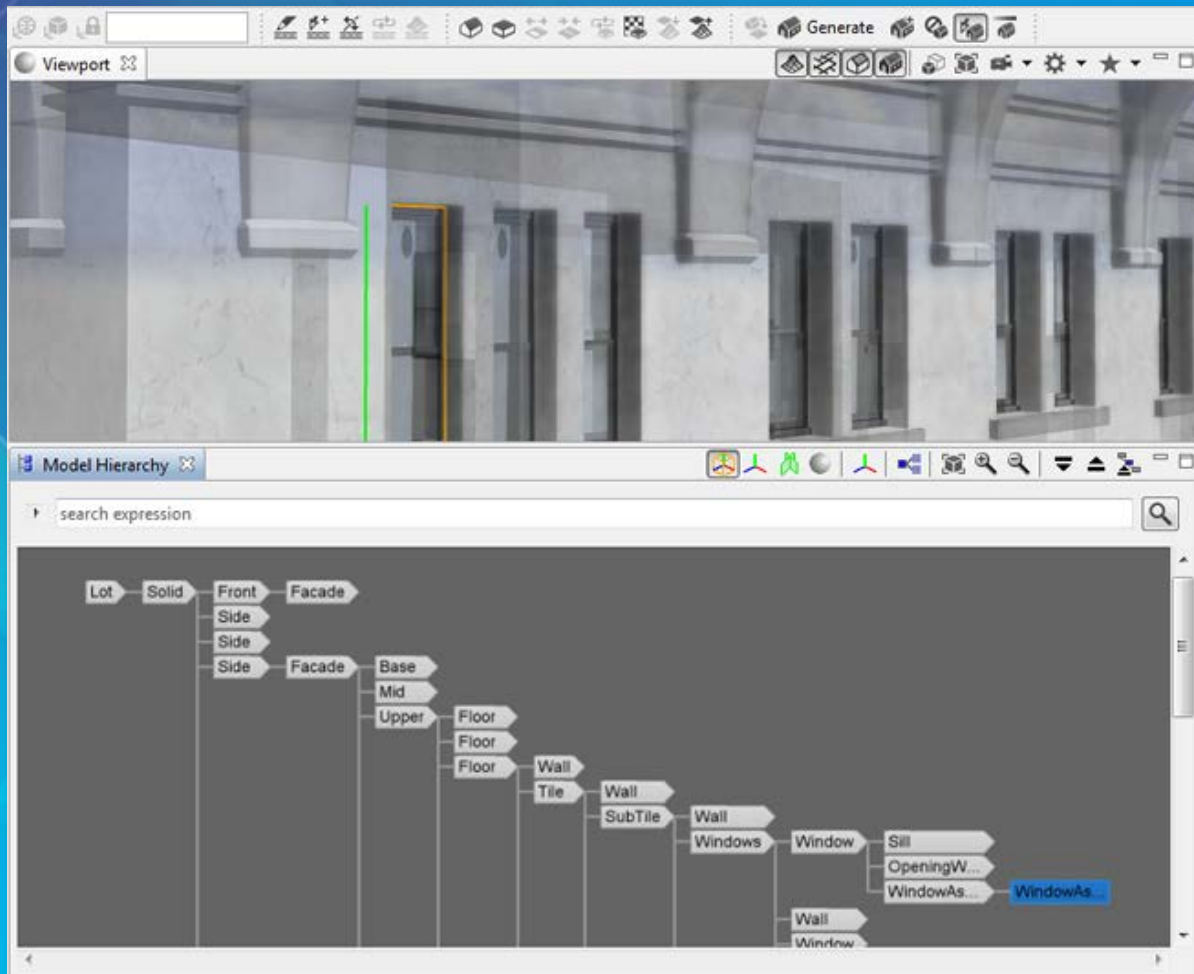






## 6. Prepare Affected Buildings

# Leaf Shapes?!





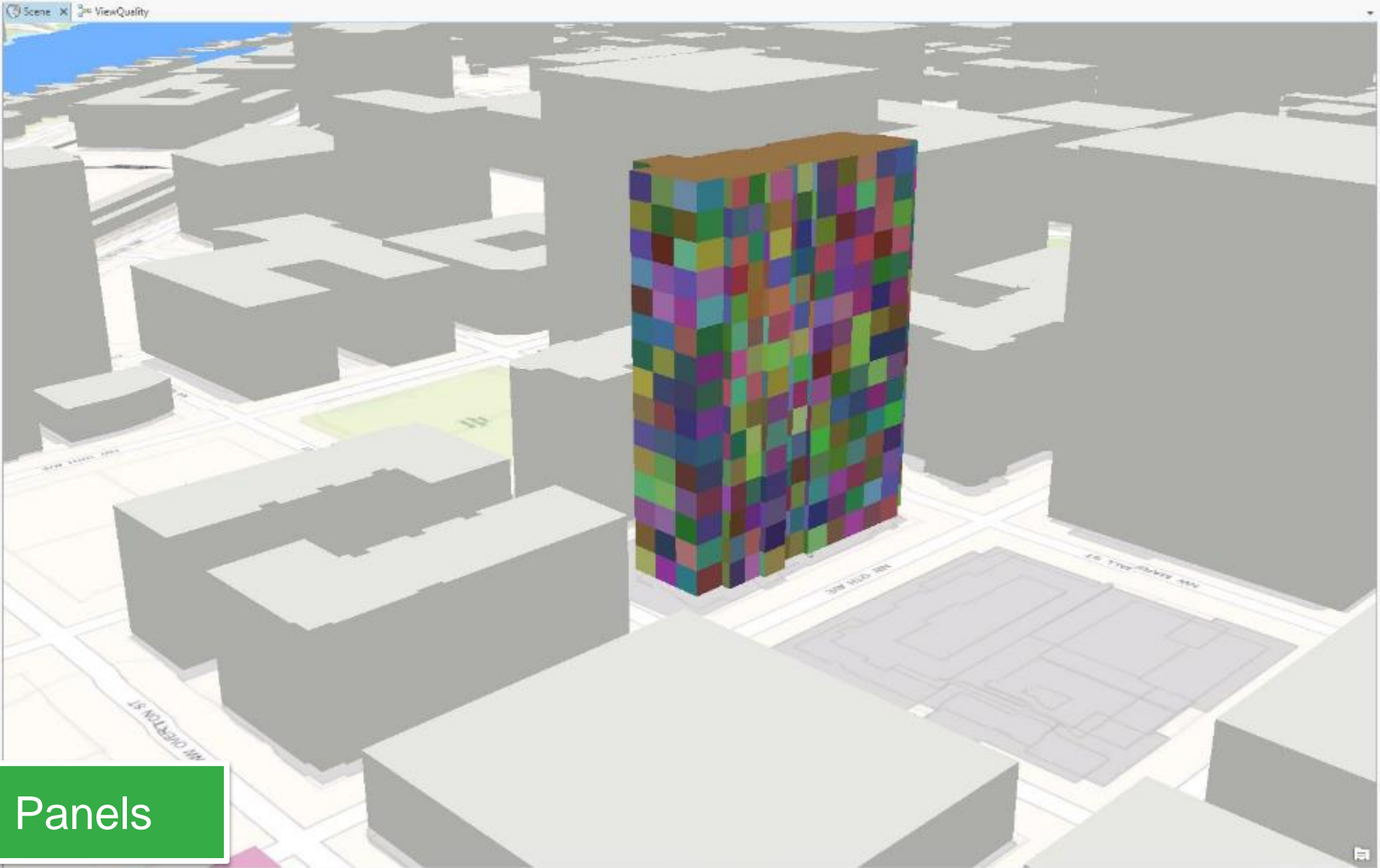
Contents

Scene X ViewQuality

Search

Drawing Order

- Scene
  - 3D Layers
    - Existing@Building2Panelized\_MPoint
    - Existing@Building2Panelized\_Points
    - Existing@Building2Panelized\_Lines
    - Existing@Building2Panelized
      - ID
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        - OID\_10;0;0;10
        - OID\_10;0;0;11
        - OID\_10;0;0;12
        - OID\_10;0;0;13
        - OID\_10;0;0;14
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        - OID\_10;0;0;2
        - OID\_10;0;0;3
        - OID\_10;0;0;4
        - OID\_10;0;0;5
        - OID\_10;0;0;6
        - OID\_10;0;0;7
        - OID\_10;0;0;8
        - OID\_10;0;0;9
        - OID\_10;0;10;0
        - OID\_10;0;10;10
        - OID\_10;0;10;11
        - OID\_10;0;10;12
        - OID\_10;0;10;13
        - OID\_10;0;10;14
        - OID\_10;0;10;1
        - OID\_10;0;10;2
        - OID\_10;0;10;3
        - OID\_10;0;10;4
        - OID\_10;0;10;5



7a. Resulting Panels

Contents

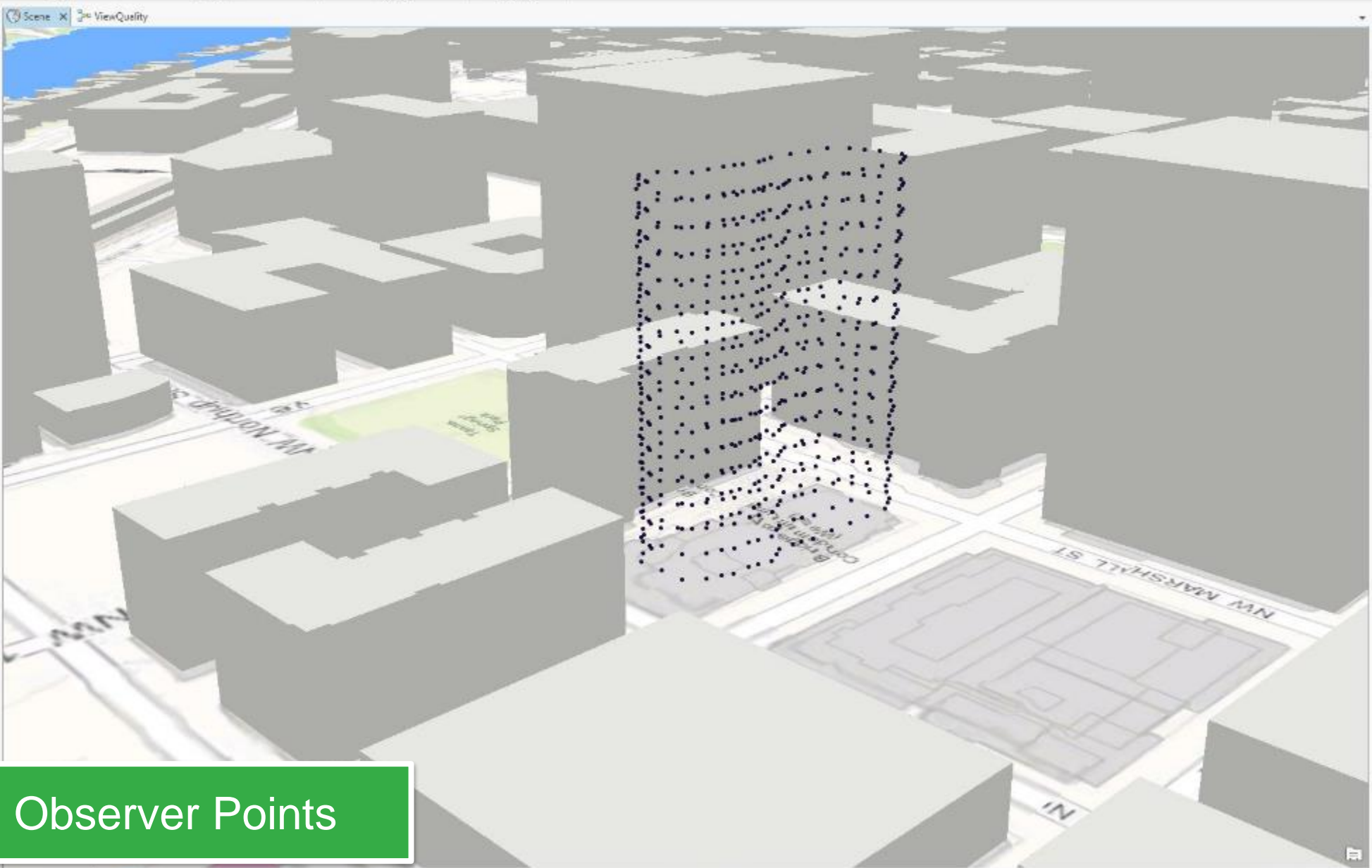
Scene ViewQuality

Search

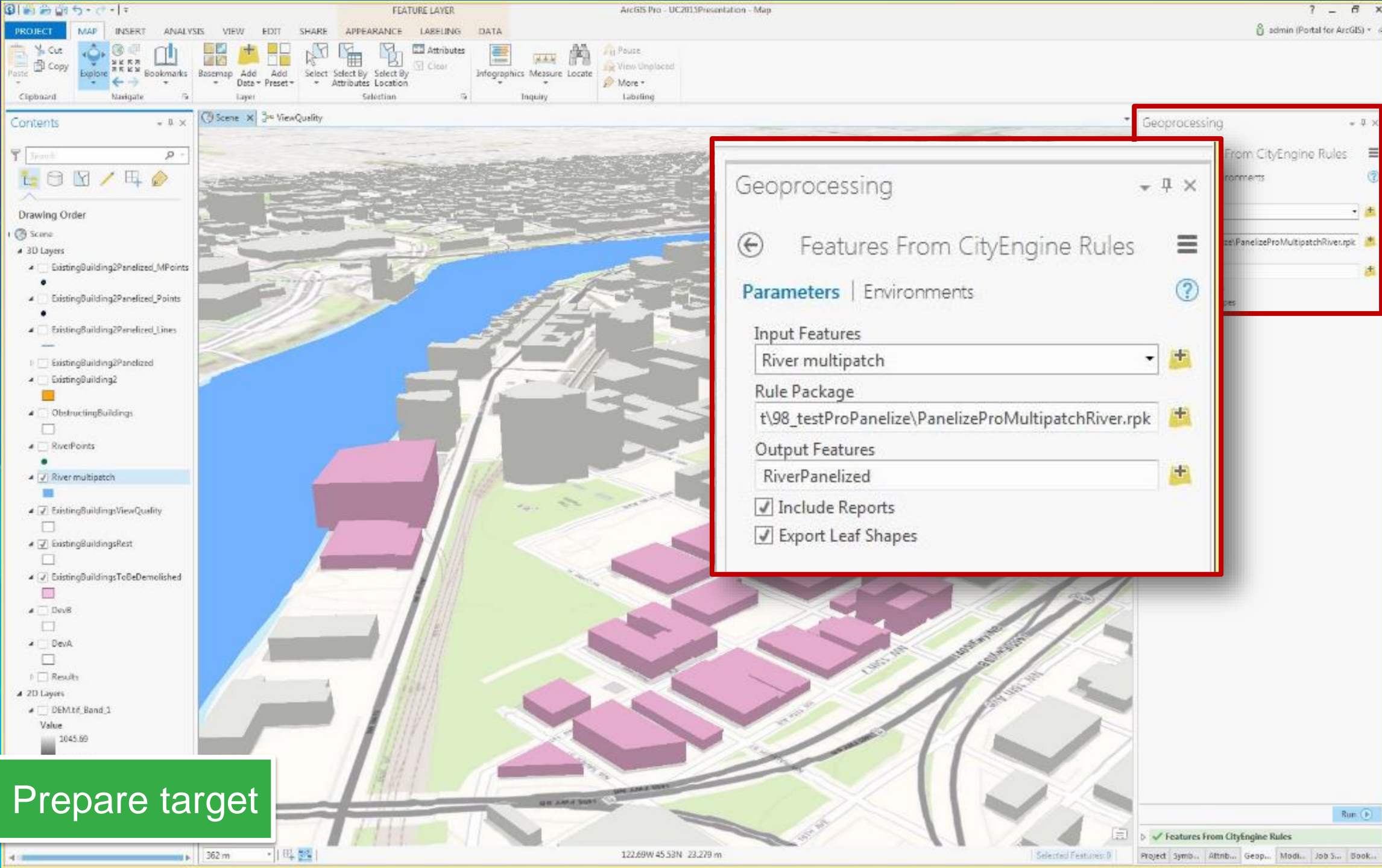
Drawing Order

- Scene
  - 3D Layers
    - Existing@Building2Panelized\_MPoints
    - Existing@Building2Panelized\_Points
    - Existing@Building2Panelized\_Lines
    - Existing@Building2Panelized
    - Existing@Building2
    - ObstructingBuildings
    - RiverPoints
    - River multipatch
    - ExistingBuildingsViewQuality
    - ExistingBuildingsRest
    - ExistingBuildingsToBeDemolished
    - DevB
    - DevA
    - Results
  - 2D Layers
    - DEM.tif\_Band\_1

Value: 1045.09

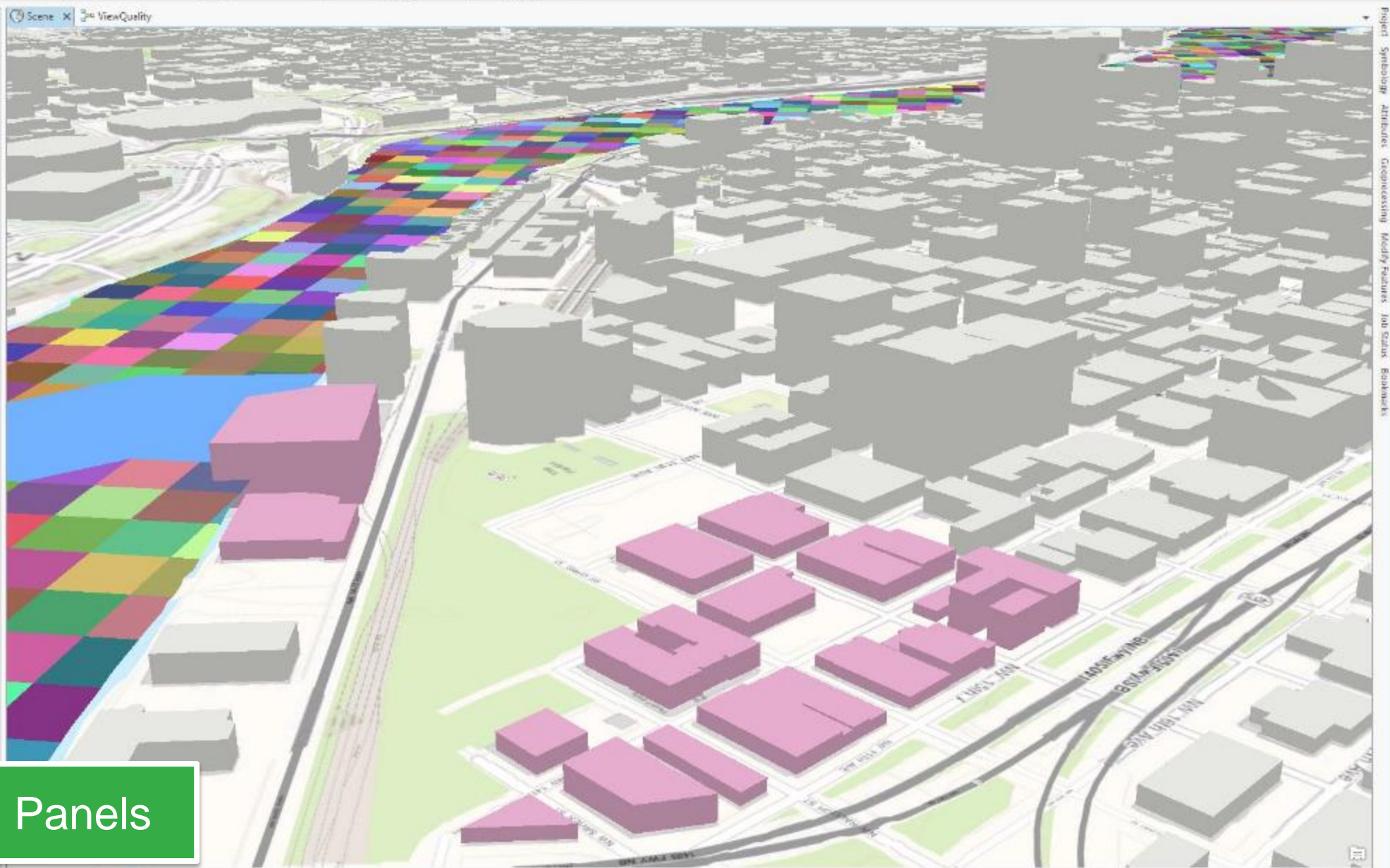


7b. Resulting Observer Points



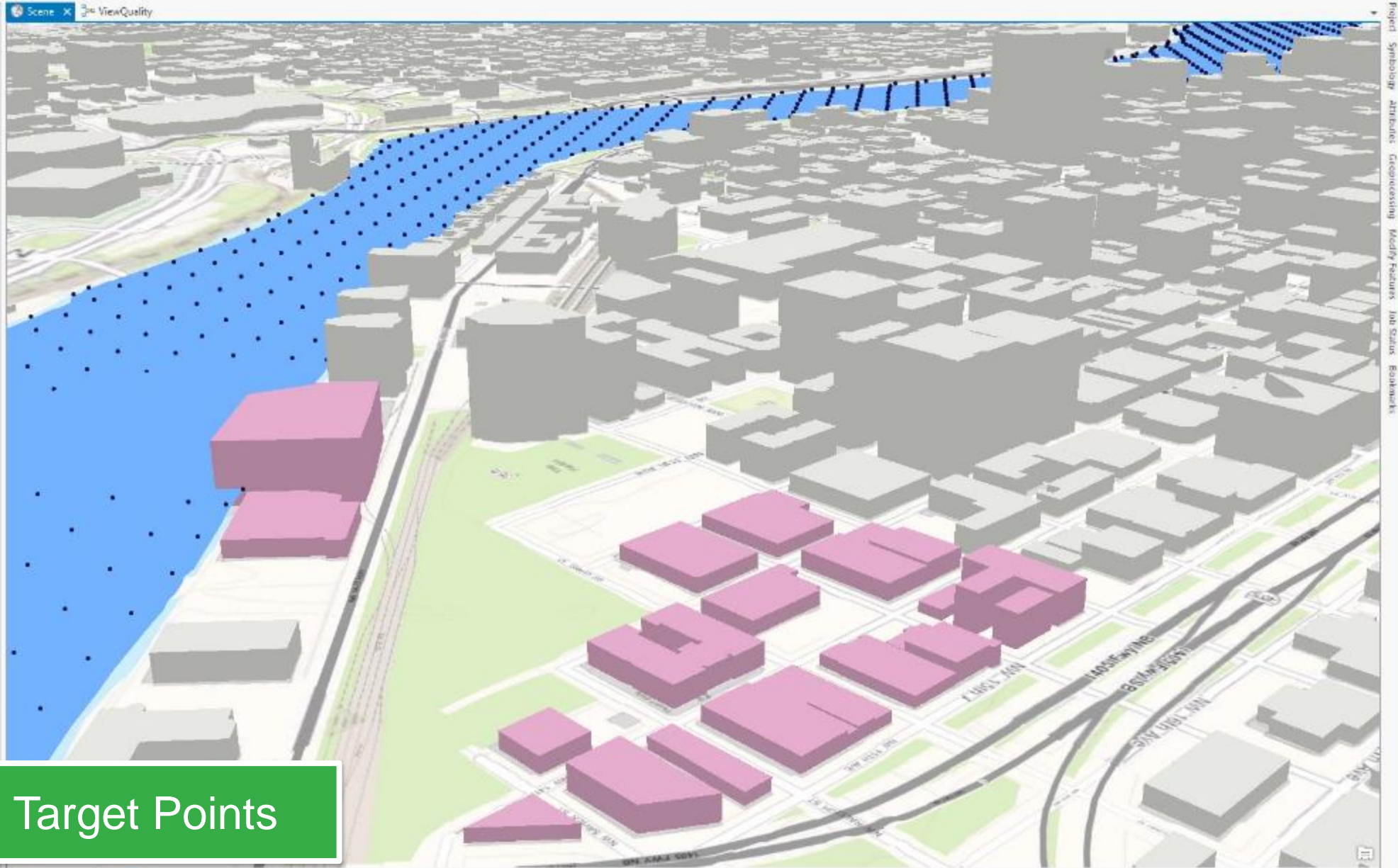
8. Prepare target

- Contents
- Scene ViewQuality
- 3D Layers
- RiverPanelized\_MPoints
  - RiverPanelized\_Points
  - RiverPanelized
  - RiverPanelized\_Lines
  - ExistingBuilding2Panelized\_MPo
  - ExistingBuilding2Panelized\_Point
  - ExistingBuilding2Panelized\_Lines
  - ExistingBuilding2Panelized
  - ExistingBuilding2
  - ObstructingBuildings
  - RiverPoints
  - River multipatch
  - ExistingBuildingsViewQuality
  - ExistingBuildingsRest
  - ExistingBuildingsToBeDemolishe
  - DivB



8a. Resulting Panels

- Contents
- Scene ViewQuality
- Search
- Drawing Order
- Scene
  - 3D Layers
    - RiverPanelized\_MPoints
    - RiverPanelized\_Points
    - ExistingBuilding2Panelized\_MPoint
    - ExistingBuilding2Panelized\_Points
    - RiverPanelized\_Lines
    - ExistingBuilding2Panelized\_Lines
    - RiverPanelized
    - ExistingBuilding2Panelized
    - ExistingBuilding2
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    - RiverPoints
    - River multipatch
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    - ExistingBuildingsRest
    - ExistingBuildingsToBeDemolished
    - Dev8



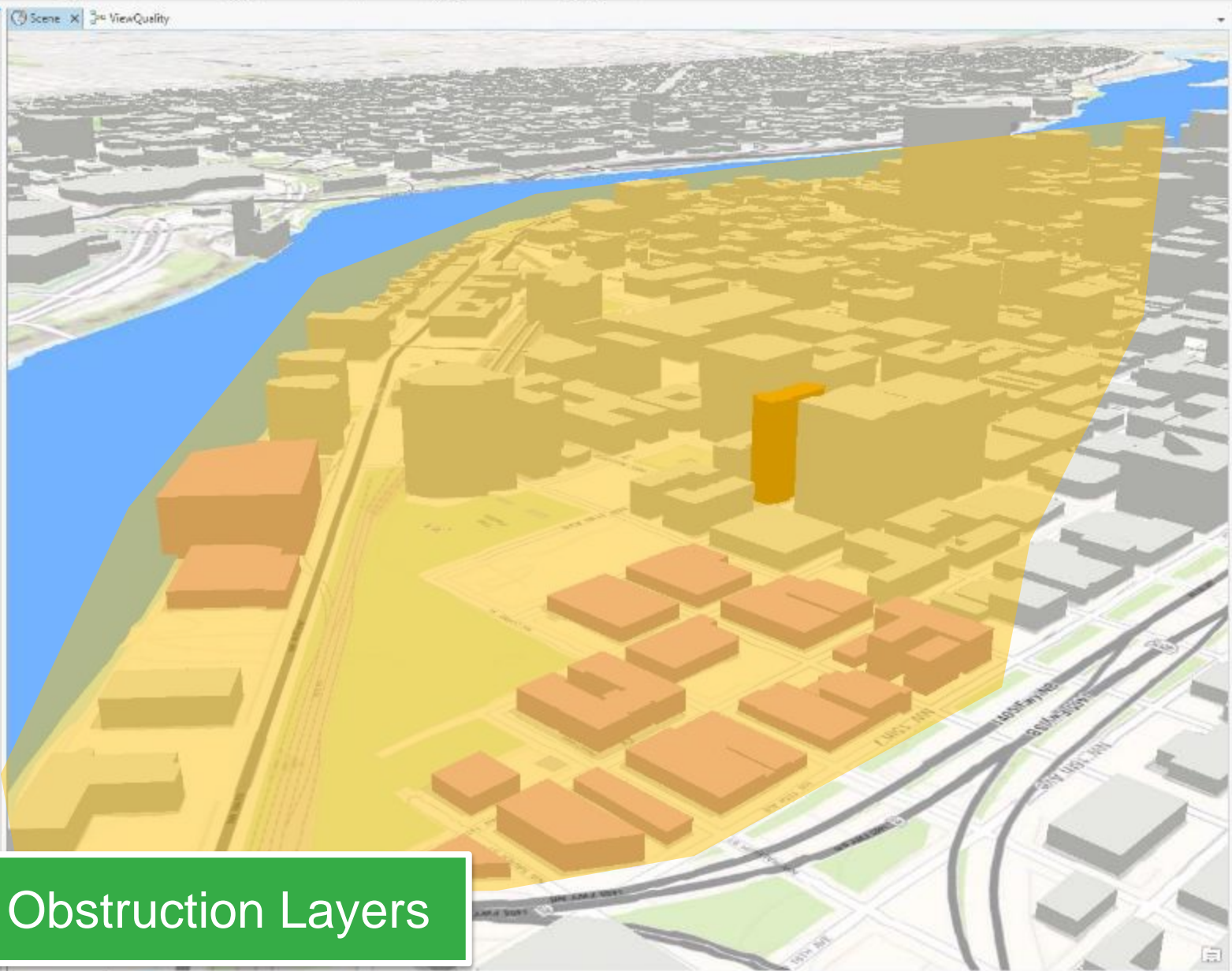
8b. Resulting Target Points

Contents

Scene ViewQuality

Drawing Order

- Scene
  - 3D Layers
    - RiverPanelized\_MPoints
    - RiverPanelized\_Points
    - RiverPanelized
    - RiverPanelized\_Lines
    - ExistingBuilding2Panelized\_MPo
    - ExistingBuilding2Panelized\_Point
    - ExistingBuilding2Panelized\_Lines
    - ExistingBuilding2Panelized
    - ExistingBuilding2
    - ObstructingBuildings
    - RiverPoints
    - River multipatch
    - ExistingBuildingsViewQuality
    - ExistingBuildingsRest
    - ExistingBuildingsToBeDemolishe
    - DivB



Geoprocessing

ViewQuality

Parameters | Environments

Observer points (eg building facade)  
ExistingBuilding2Panelized\_Points

Observer multipatch (eg building facade)  
ExistingBuilding2Panelized

Target points (eg river)  
RiverPanelized\_Points

Obstructions (eg DEM, buildings)  
ObstructingBuildings  
DEM.tif\_Band\_1

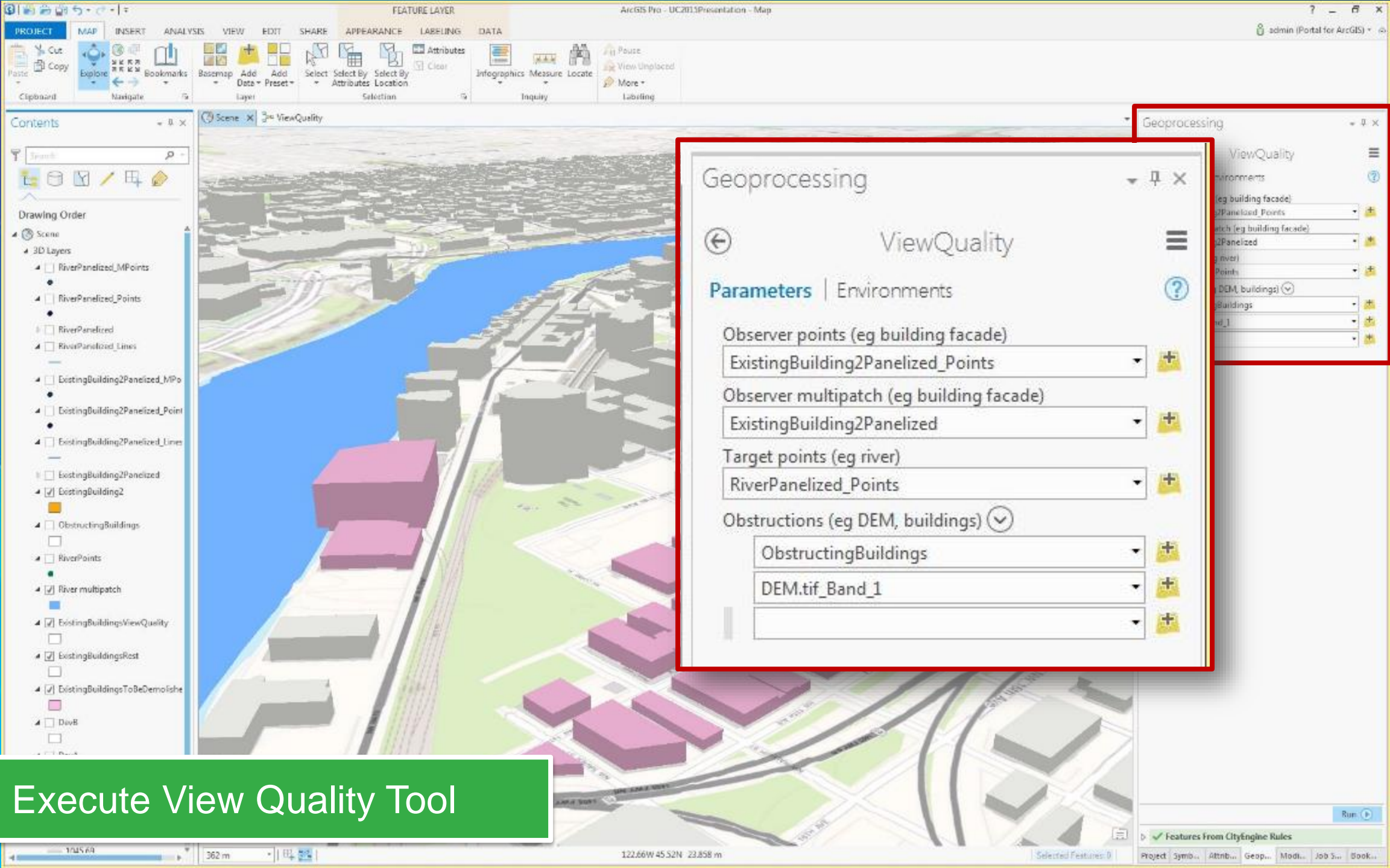
Run

Features From CityEngine Rules

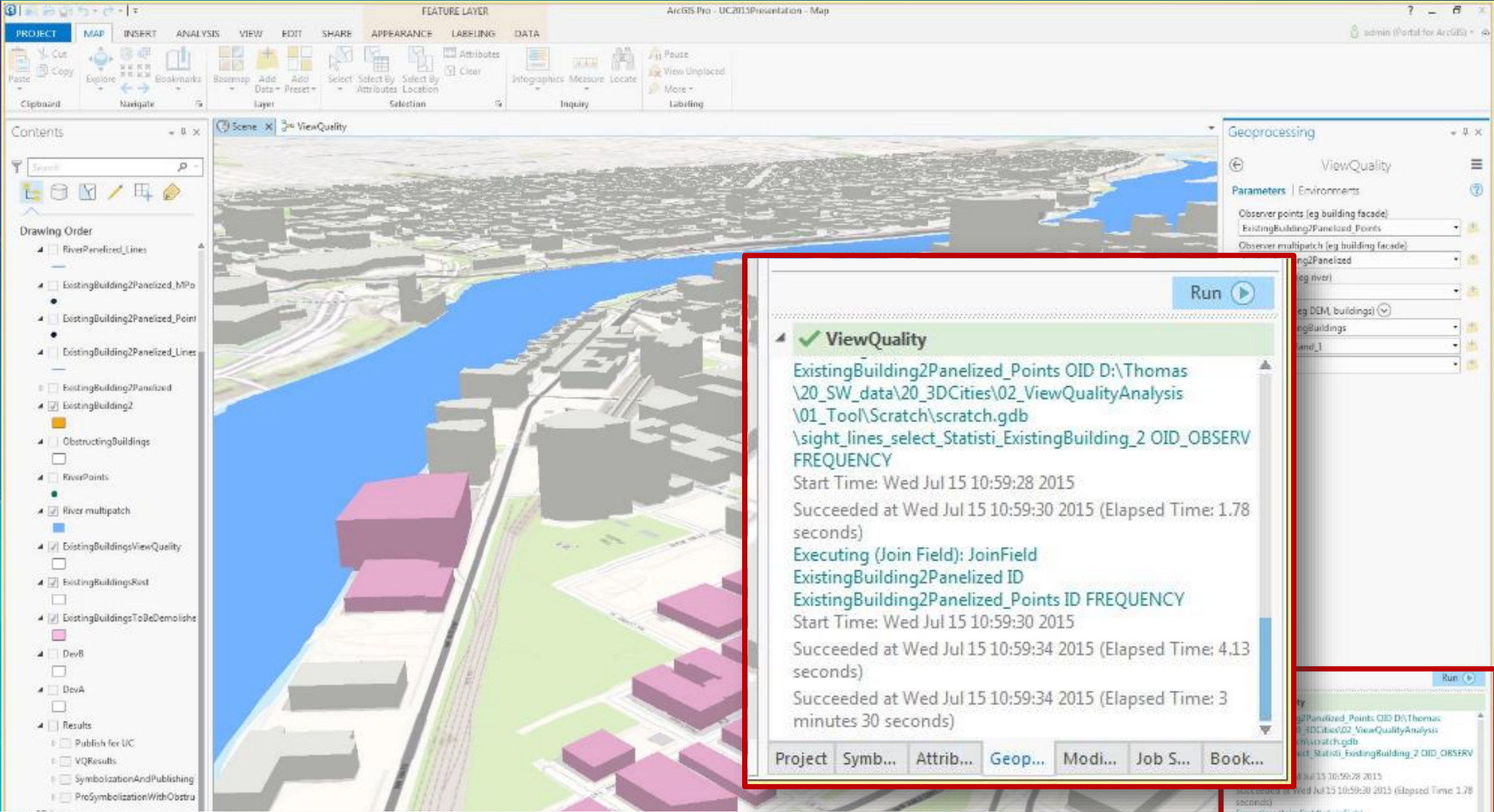
Project | Symb... | Attrib... | Geop... | Modi... | Job S... | Book...

# 9. Aggregate Obstruction Layers





## 9. Execute View Quality Tool



9a. Execute View Quality Tool – Running... Complete!

PROJECT MAP INSERT ANALYSIS VIEW EDIT SHARE APPEARANCE LABELING DATA

Clipboard: Cut, Copy, Paste, Explore, Bookmarks, Navigate

Layer: Basemap, Add Data, Add Preset

Selection: Select, Select By Attributes, Select By Location, Clear

Inquiry: Infographics, Measure, Locate

Labeling: Attributes, View Unplaced, More

Contents

Scene ViewQuality

Drawing Order

- RiverPanelized\_Lines
- ExistingBuilding2Panelized\_MPoints
- ExistingBuilding2Panelized\_Points
- ExistingBuilding2Panelized\_Lines
- ExistingBuilding2Panelized
- ExistingBuilding2
- ObstructingBuildings
- RiverPoints
- River multipatch
- ExistingBuilding2ViewQuality
- ExistingBuildingsRest
- ExistingBuildingsToBeDemolished
- DevB
- DevA
- Results
  - Publish for UC
  - VQResults
  - SymbolizationAndPublishingTests
  - ProSymbolizationWithObstructions



OID	Shape	OriginalOID	World_Orientation	Type	Volume	Area	ID	Local_Orient	FREQUENCY
1	MultiPatch	1	<Null>	ModelRemainder	<Null>	<Null>	<Null>	<Null>	<Null>
2	MultiPatch	1	north	Panel	0	22.708645	OID_10,0,0;	front	<Null>
3	MultiPatch	1	north	Panel	0	22.708643	OID_10,0,0,1;	front	<Null>
4	MultiPatch	1	north	Panel	0	22.708645	OID_10,0,0,2;	front	6
5	MultiPatch	1	north	Panel	0	22.708645	OID_10,0,0,3;	front	8
6	MultiPatch	1	north	Panel	0	22.708647	OID_10,0,0,4;	front	8
7	MultiPatch	1	north	Panel	0	22.708647	OID_10,0,0,5;	front	9
8	MultiPatch	1	north	Panel	0	22.708656	OID_10,0,0,6;	front	42
9	MultiPatch	1	north	Panel	0	22.708657	OID_10,0,0,7;	front	56
10	MultiPatch	1	north	Panel	0	22.708637	OID_10,0,0,8;	front	83
11	MultiPatch	1	north	Panel	0	22.708654	OID_10,0,0,9;	front	97
12	MultiPatch	1	north	Panel	0	22.708637	OID_10,0,0,10;	front	107
13	MultiPatch	1	north	Panel	0	22.708639	OID_10,0,0,11;	front	115
14	MultiPatch	1	north	Panel	0	22.708656	OID_10,0,0,12;	front	124
			north	Panel	0	22.708656	OID_10,0,0,13;	front	129
			north	Panel	0	22.708656	OID_10,0,0,14;	front	135
			east	Panel	0	4.877349	OID_10,0,1,0;	right	142
			east	Panel	0	4.877349	OID_10,0,1,1;	right	<Null>
			east	Panel	0	4.877348	OID_10,0,1,2;	right	<Null>
			east	Panel	0	4.877349	OID_10,0,1,3;	right	6
			east	Panel	0	4.877349	OID_10,0,1,4;	right	8
			east	Panel	0	4.877348	OID_10,0,1,5;	right	9
			east	Panel	0	4.877349	OID_10,0,1,6;	right	42
			east	Panel	0	4.877348	OID_10,0,1,7;	right	56
			east	Panel	0	4.877349	OID_10,0,1,8;	right	83
			east	Panel	0	4.877348	OID_10,0,1,9;	right	97
			east	Panel	0	4.877349	OID_10,0,1,10;	right	107
			east	Panel	0	4.877348	OID_10,0,1,11;	right	115
			east	Panel	0	4.877349	OID_10,0,1,12;	right	124
			east	Panel	0	4.877348	OID_10,0,1,13;	right	129
			east	Panel	0	4.877349	OID_10,0,1,14;	right	135
			east	Panel	0	4.877348	OID_10,0,1,15;	right	142
			east	Panel	0	4.877349	OID_10,0,1,16;	right	<Null>
			east	Panel	0	4.877348	OID_10,0,1,17;	right	<Null>
			east	Panel	0	4.877349	OID_10,0,1,18;	right	6
			east	Panel	0	4.877348	OID_10,0,1,19;	right	8
			east	Panel	0	4.877349	OID_10,0,1,20;	right	9
			east	Panel	0	4.877348	OID_10,0,1,21;	right	42
			east	Panel	0	4.877349	OID_10,0,1,22;	right	56
			east	Panel	0	4.877348	OID_10,0,1,23;	right	83
			east	Panel	0	4.877349	OID_10,0,1,24;	right	97
			east	Panel	0	4.877348	OID_10,0,1,25;	right	107
			east	Panel	0	4.877349	OID_10,0,1,26;	right	115
			east	Panel	0	4.877348	OID_10,0,1,27;	right	124
			east	Panel	0	4.877349	OID_10,0,1,28;	right	129
			east	Panel	0	4.877348	OID_10,0,1,29;	right	135
			east	Panel	0	4.877349	OID_10,0,1,30;	right	142
			east	Panel	0	4.877348	OID_10,0,1,31;	right	<Null>
			east	Panel	0	4.877349	OID_10,0,1,32;	right	<Null>
			east	Panel	0	4.877348	OID_10,0,1,33;	right	6
			east	Panel	0	4.877349	OID_10,0,1,34;	right	8
			east	Panel	0	4.877348	OID_10,0,1,35;	right	9
			east	Panel	0	4.877349	OID_10,0,1,36;	right	42
			east	Panel	0	4.877348	OID_10,0,1,37;	right	56
			east	Panel	0	4.877349	OID_10,0,1,38;	right	83
			east	Panel	0	4.877348	OID_10,0,1,39;	right	97
			east	Panel	0	4.877349	OID_10,0,1,40;	right	107
			east	Panel	0	4.877348	OID_10,0,1,41;	right	115
			east	Panel	0	4.877349	OID_10,0,1,42;	right	124
			east	Panel	0	4.877348	OID_10,0,1,43;	right	129
			east	Panel	0	4.877349	OID_10,0,1,44;	right	135
			east	Panel	0	4.877348	OID_10,0,1,45;	right	142
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			east	Panel	0	4.877348	OID_10,0,1,47;	right	<Null>
			east	Panel	0	4.877349	OID_10,0,1,48;	right	6
			east	Panel	0	4.877348	OID_10,0,1,49;	right	8
			east	Panel	0	4.877349	OID_10,0,1,50;	right	9
			east	Panel	0	4.877348	OID_10,0,1,51;	right	42
			east	Panel	0	4.877349	OID_10,0,1,52;	right	56
			east	Panel	0	4.877348	OID_10,0,1,53;	right	83
			east	Panel	0	4.877349	OID_10,0,1,54;	right	97
			east	Panel	0	4.877348	OID_10,0,1,55;	right	107
			east	Panel	0	4.877349	OID_10,0,1,56;	right	115
			east	Panel	0	4.877348	OID_10,0,1,57;	right	124
			east	Panel	0	4.877349	OID_10,0,1,58;	right	129
			east	Panel	0	4.877348	OID_10,0,1,59;	right	135
			east	Panel	0	4.877349	OID_10,0,1,60;	right	142
			east	Panel	0	4.877348	OID_10,0,1,61;	right	<Null>
			east	Panel	0	4.877349	OID_10,0,1,62;	right	<Null>
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			east	Panel	0	4.877349	OID_10,0,1,64;	right	8
			east	Panel	0	4.877348	OID_10,0,1,65;	right	9
			east	Panel	0	4.877349	OID_10,0,1,66;	right	42
			east	Panel	0	4.877348	OID_10,0,1,67;	right	56
			east	Panel	0	4.877349	OID_10,0,1,68;	right	83
			east	Panel	0	4.877348	OID_10,0,1,69;	right	97
			east	Panel	0	4.877349	OID_10,0,1,70;	right	107
			east	Panel	0	4.877348	OID_10,0,1,71;	right	115
			east	Panel	0	4.877349	OID_10,0,1,72;	right	124
			east	Panel	0	4.877348	OID_10,0,1,73;	right	129
			east	Panel	0	4.877349	OID_10,0,1,74;	right	135
			east	Panel	0	4.877348	OID_10,0,1,75;	right	142
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			east	Panel	0	4.877348	OID_10,0,1,79;	right	8
			east	Panel	0	4.877349	OID_10,0,1,80;	right	9
			east	Panel	0	4.877348	OID_10,0,1,81;	right	42
			east	Panel	0	4.877349	OID_10,0,1,82;	right	56
			east	Panel	0	4.877348	OID_10,0,1,83;	right	83
			east	Panel	0	4.877349	OID_10,0,1,84;	right	97
			east	Panel	0	4.877348	OID_10,0,1,85;	right	107
			east	Panel	0	4.877349	OID_10,0,1,86;	right	115
			east	Panel	0	4.877348	OID_10,0,1,87;	right	124
			east	Panel	0	4.877349	OID_10,0,1,88;	right	129
			east	Panel	0	4.877348	OID_10,0,1,89;	right	135
			east	Panel	0	4.877349	OID_10,0,1,90;	right	142
			east	Panel	0	4.877348	OID_10,0,1,91;	right	<Null>
			east	Panel	0	4.877349	OID_10,0,1,92;	right	<Null>
			east	Panel	0	4.877348	OID_10,0,1,93;	right	6
			east	Panel	0	4.877349	OID_10,0,1,94;	right	8
			east	Panel	0	4.877348	OID_10,0,1,95;	right	9
			east	Panel	0	4.877349	OID_10,0,1,96;	right	42
			east	Panel	0	4.877348	OID_10,0,1,97;	right	56
			east	Panel	0	4.877349	OID_10,0,1,98;	right	83
			east	Panel	0	4.877348	OID_10,0,1,99;	right	97
			east	Panel	0	4.877349	OID_10,0,1,100;	right	107

Geoprocessing

ViewQuality

Parameters | Environments

Observer points (eg building facade): ExistingBuilding2Panelized\_Points

Observer multipatch (eg building facade): ExistingBuilding2Panelized

Target points (eg river): RiverPoints

Obstructions (eg DEM, buildings): ObstructingBuildings, DEM.tif\_Band\_1

Run

10. Confirm Results

# 10. Apply Symbology

The screenshot displays the ArcGIS Pro interface with a 3D city model. The Symbology pane is open, showing the following settings:

- Layer: ExistingBuilding2Panelized
- Symbology: Graduated Colors
- Field: FREQUENCY
- Normalization: <none>
- Method: Manual Interval
- Classes: 10
- Color scheme: A green-to-yellow gradient

The Class breaks table is as follows:

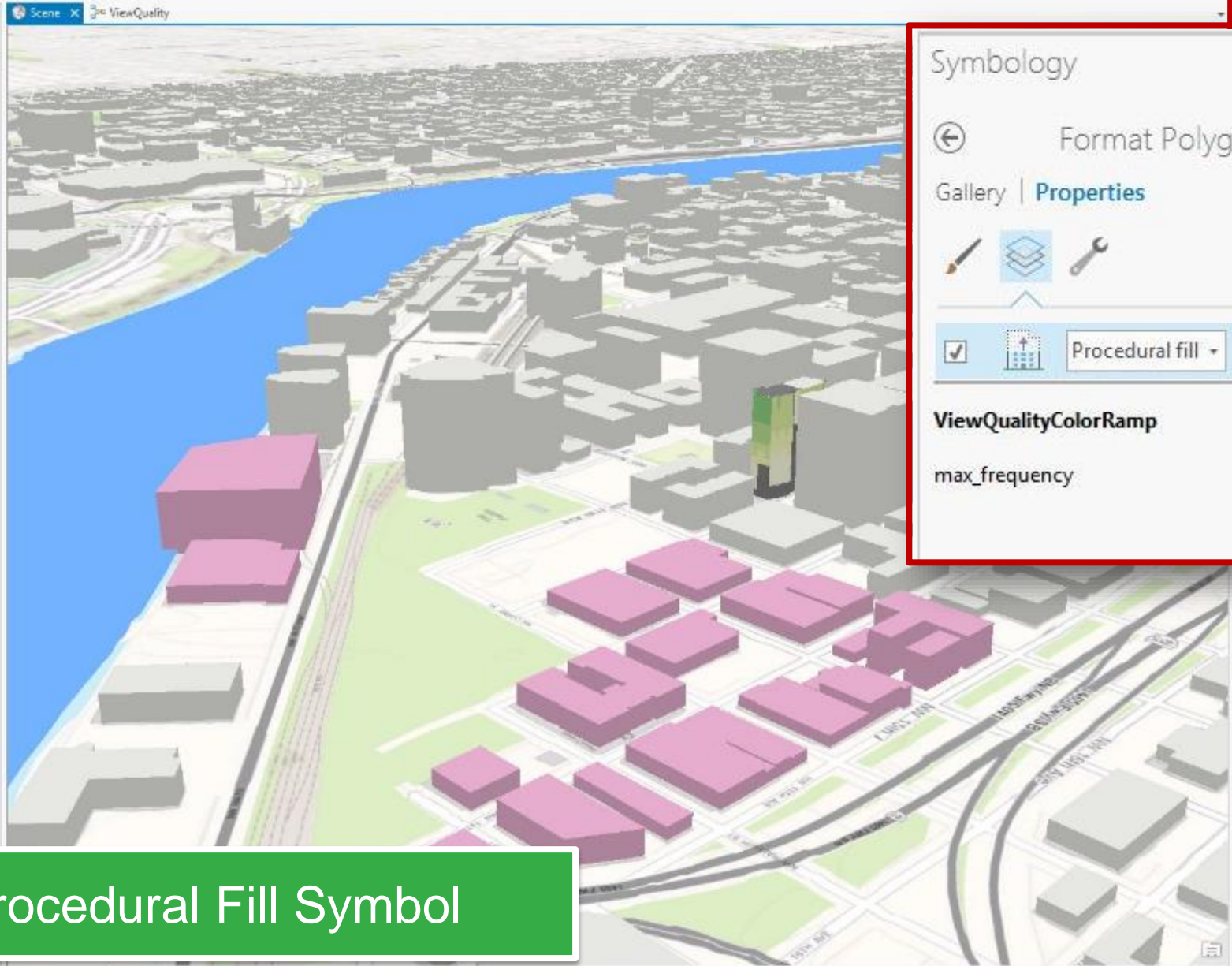
Symbol	Upper value	Label
Lightest yellow	≤ 30.0	≤30
Light yellow	≤ 60.0	≤60
Yellow-green	≤ 90.0	≤90
Light green	≤ 120.0	≤120
Green	≤ 150.0	≤150
Dark green	≤ 180.0	≤180
Very dark green	≤ 210.0	≤210
Dark green	≤ 240.0	≤240
Dark green	≤ 270.0	≤270
Darkest green	≤ 300.0	≤300



# Sharing your 3D City

Thorsten Reitz

- Contents
- Scene x ViewQuality
- Drawing Order
- Scene
  - 3D Layers
    - RiverPanelized\_MPoints
    - RiverPanelized\_Points
    - RiverPanelized
    - RiverPanelized\_Lines
    - ExistingBuilding2Panelized\_MPoints
    - ExistingBuilding2Panelized\_Points
    - ExistingBuilding2Panelized\_Lines
    - ExistingBuilding2Panelized
    - ExistingBuilding2
    - ObstructingBuildings
    - RiverPoints
    - River: multipatch
    - ExistingBuildingsViewQuality
    - ExistingBuildingsRest
    - ExistingBuildingsToBeDemolished
    - Dev8



### Symbology

Format Polygon Symbol

Gallery | Properties

Procedural fill

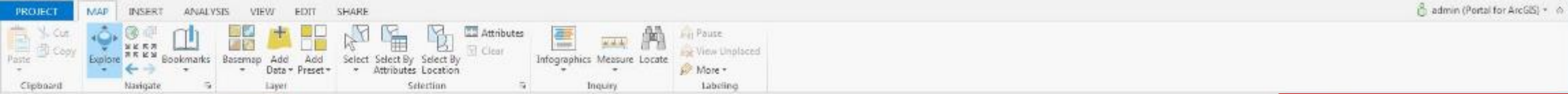
**ViewQualityColorRamp**

max\_frequency 300

Rule...

Apply Cancel

# 1. Prepare Procedural Fill Symbol

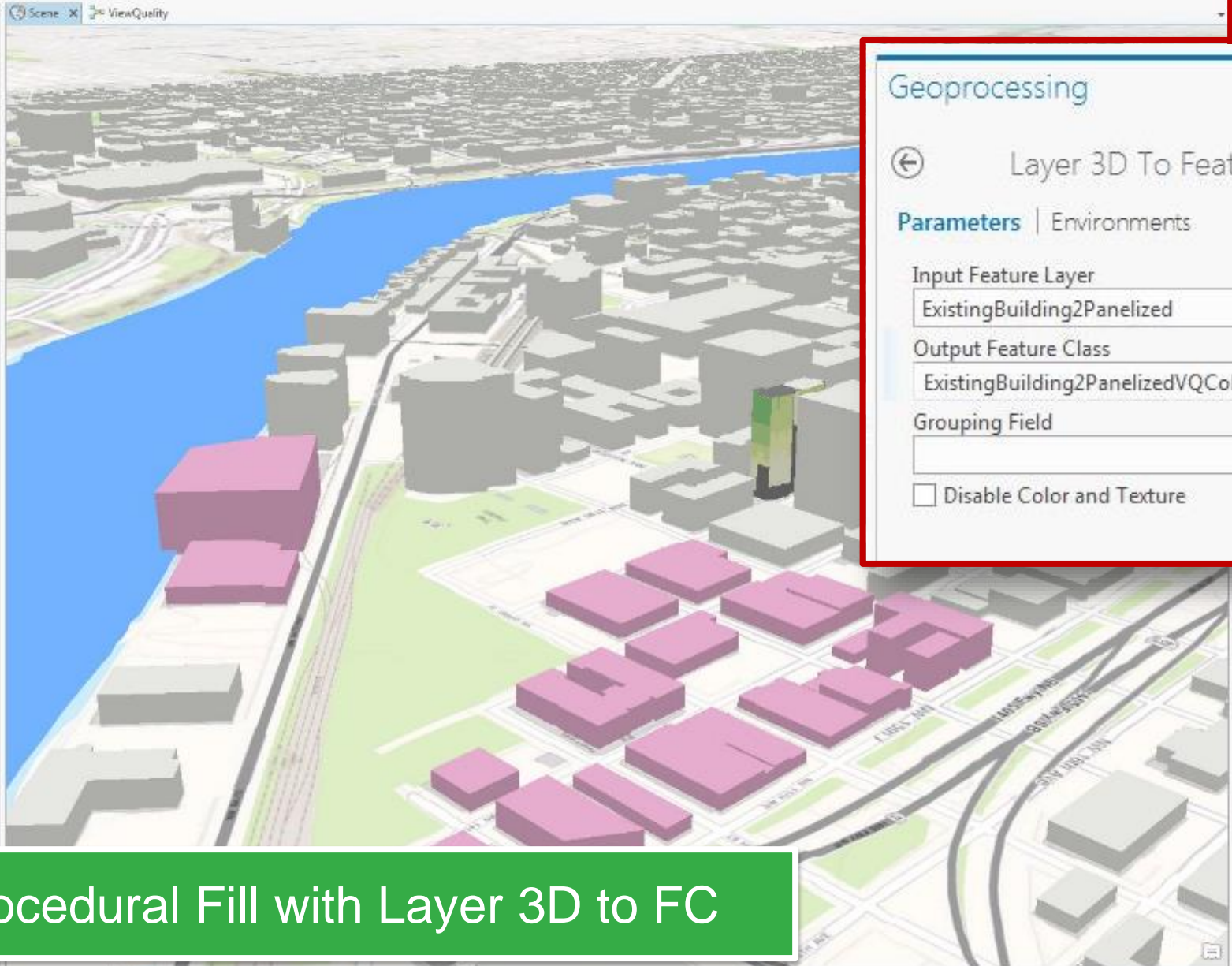


Contents

Scene x ViewQuality

Scene

- 3D Layers
  - RiverPanelized\_MPoints
  - RiverPanelized\_Points
  - RiverPanelized
  - RiverPanelized\_Lines
  - ExistingBuilding2Panelized\_MPo
  - ExistingBuilding2Panelized\_Point
  - ExistingBuilding2Panelized\_Lines
  - ExistingBuilding2Panelized
  - ExistingBuilding2
  - ObstructingBuildings
  - RiverPoints
  - River multipatch
  - ExistingBuildingsViewQuality
  - ExistingBuildingsRest
  - ExistingBuildingsToBeDemolish
  - DevB



Geoprocessing

Geoprocessing

← Layer 3D To Feature Class

Parameters | Environments

Input Feature Layer  
ExistingBuilding2Panelized

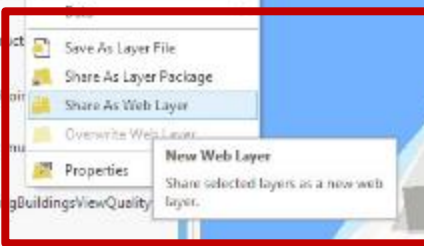
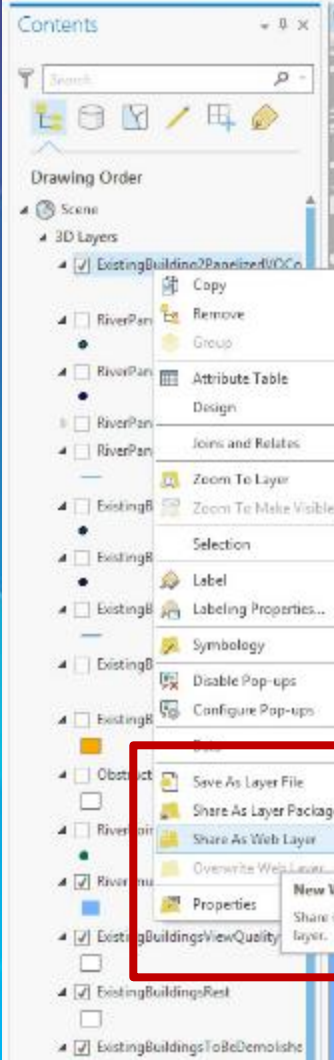
Output Feature Class  
ExistingBuilding2PanelizedVQColorRampFC

Grouping Field

Disable Color and Texture

Run

2. Burn in Procedural Fill with Layer 3D to FC



### 3. Share as Web Layer



## 4. Configure Share Web Layer

The screenshot shows the ArcGIS Pro interface with a 3D city model. The 'Share Web Layer' dialog box is open, displaying the following configuration:

- Name:** ExistingBuilding2PanelizedVQColorRampFC
- Layer Type:** Scene
- Item Description:**
  - Summary:** (Empty text box)
  - Tags:** (Empty text box)
- Sharing Options:**
  - My Content
  - Portal for ArcGIS
  - Everyone
  - Groups (Dropdown menu)
- Finish Sharing:**
  - Analyze (Green checkmark icon)
  - Publish (Cloud icon)
  - Jobs (Calendar icon)

The background shows a 3D city model with a river and buildings. The 'Contents' pane on the left lists various layers, including 'ExistingBuilding2PanelizedVQColorRampFC' which is selected. The 'Jobs' button is highlighted in the dialog box.



# Using and Extending the Living Atlas of the World

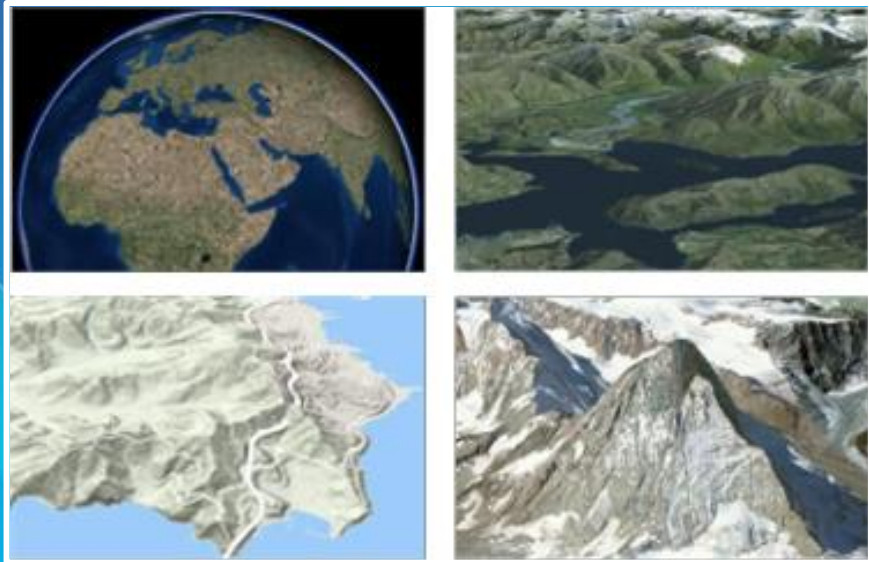
Brian Sims



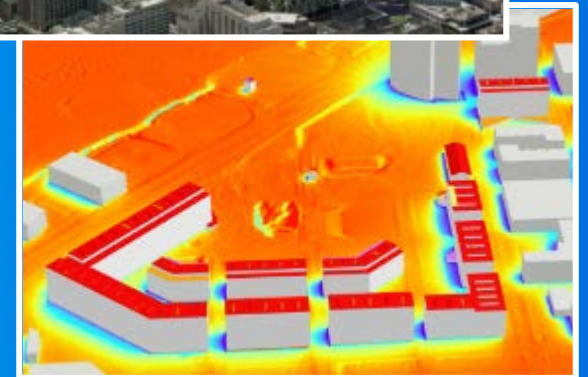
# Using + Extending the Living Atlas

Ready-to-Use Content from Esri

## World Elevation Service



## Example Web Scenes



## Wrap Up:

- Go 3D for more informed and faster decision making
- Get started at <http://esriurl.com/3DCities>
- Use and contribute to the Living Atlas

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# Thank You

## Questions?