Working in 3D with ArcGIS Pro

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Agenda

- 3D Platform Overview
- 3D Cities workflow 2D to 3D – City of Raleigh
  - Leveraging Existing GIS Data, + Feature Extraction in ArcGIS Pro
- FAA Special Use Airspace Analysis
- Public Safety Workflows in 3D
  - Space time Cubes
- Line of Sight Geoprocessing Analysis
- 3D Editing Workflow for Rooftop Garden
ArcGIS is a Platform for Planning

Making mapping and location aware apps available across your organization

**Applications**

- **ArcGIS Online / Portal**
  - ArcGIS for Local Government solution templates

- **ArcGIS Pro**
  - Data management, analysis, and publishing of 2D and 3D scenarios

- **GeoPlanner**
  - Conceptual planning and analysis in a single collaborative web application

- **CityEngine**
  - Improving urban planning and design with efficient 3D scenario authoring

**Capabilities**

- **3D Scene Services**
  - View, create, and share 3D scenes in your browser

- **Procedural Rules**
  - Leverage GIS attributes to quickly generate 3D models from 2D data

- **Spatial Analysis**
  - Understand and measure impact on natural and man-made systems

**ArcGIS Platform**
3D Across The Platform

Complete workflow for editing, managing, publishing and sharing data in 3D

ArcGIS Pro
CityEngine
3D Analyst

Portal

ArcGIS Runtime
ArcGIS Online
ArcGIS JavaScript API

Server
Online Content and Services
3D Platform - ArcGIS Pro (focus of this session)

ArcGIS PRO
- 64-bit Desktop GIS Application
- Design & Edit in 2D + 3D at the Same Time
- Publish web maps to ArcGIS Online and Portal
- Run Procedural CityEngine Rules as Symbology
3D Platform – CityEngine + Procedural rules in ArcGIS Pro

CityEngine Procedural Rules

Traditional 3D

Esri 3D

Number of Iterations

Costs
3D Scene Viewer and Services

- Combine 2D & 3D Datasets to tell a story
- View & Share scenes created in ArcGIS Pro
- Explore 3D Features from all angles
- Create Pop-up windows and infographics
2D to 3D City Workflow – City of Raleigh
Modeling 3D Cities is now Feasible

Leveraging Existing GIS Data
+ Feature Extraction in ArcGIS Pro

2D GIS Data
- Building Footprint Data
  - City Data
  - County Data
- Vegetation Data
  - City Data
  - County Data
- Street Data
  - City Data
  - Department of Transportation
- Zoning/Land Use Data
  - City Data
  - County Data
- Parcel Data
  - City Data
  - County Data
- LandCover Data
  - City Data
  - County Data

3D GIS Data
- LiDAR
- DTM (Digital Terrain Model)
- DSM (Digital Surface Model)
- nDSM (Normalized Digital Surface Model)
**3D City Levels of Detail**

Different levels of detail for Smart 3D City Models.

<table>
<thead>
<tr>
<th>Level of Detail</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Definition:</strong></td>
<td>3D Extrusion</td>
<td>3D Extrusion with Roof Form or Building Shell</td>
<td>High Detail 3D Building Models</td>
<td>Interior Spaces and Floors</td>
</tr>
<tr>
<td><strong>Data Required:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Building Footprints</td>
<td># of Stories or Total Height &amp; or Usage</td>
<td># of Stories or Total Height or Usage &amp; if available Roof Height</td>
<td>3D Building Shell with Fine details (Textured or Untextured)</td>
<td>3D Building Shell Interior Spaces (CAD or BIM)</td>
</tr>
<tr>
<td>Streets</td>
<td>Street Centerlines</td>
<td>Street Centerlines with Width attributed</td>
<td>Detailed Streets (CAD)</td>
<td>Street Furniture, Stop Lights, Signage, Infrastructure lines (GIS/CAD)</td>
</tr>
</tbody>
</table>
Operational Areas of Government for 3D

Government Departments that can immediately benefit from 3D GIS

- Economic Development
- Public Works
- Planning Department
- Utilities
- Public Safety
Existing Conditions Modeling

3D Modeling the Real-World
Demo - CityEngine Rule Packages in Pro

NASA Larc – Buildings from footprints with textures
Demo – Cumulative Line of Sight Analysis
Cameras to VIP Route
Demo – ArcPro to Webscene (new style) in 10.4 Portal
Public Safety ➤ New Methods for Visualizing and Analyzing Data in 3D
Public Safety ➤ New Methods for Visualizing and Analyzing Data in 3D
Space Time Cubes in ArcGIS Pro

- Hot Spot Analysis in 3D
- View Time and Space together
Understand and manage your city by 3D-enabling your GIS.

Create 3D City Base Layers

A 3D City needs a set of base layers—terrain, buildings, and vegetation—to provide the foundation for design and analysis. Create your 3D City by 3D-enabling your existing GIS data, and gain inspiration from other cities by exploring example 3D cities.

Perform Solar Analysis

Find rooftops suitable for solar generation for a single building or citywide. Identify potential kilowatt-hour yield for installations.

Explore example 3D Cities

See how you can better understand your city by going 3D.
- Washington, DC. Height Study
- Los Angeles Solar Potential Analysis
- Esri Campus

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