Creating and Maintaining Your 3D Basemap

Brian Sims
Dan Hedges
Gert van Maren
Complementary Resource Email
(no marketing)

• A copy of the presentation
• Links to today’s web demos
• Links to training materials
Agenda

Why 3D?
What is a 3D Basemap?

Creating a 3D Basemap

Maintaining + Sharing Best Practices

Understanding + Engaging

Q&A
Why 3D?
Brian Sims
Why 3D?

Traditionally we manage our cities like this...
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
- Communicate with non-technical audiences
- **Drive more informed decisions faster**
What is a 3D Basemap?

Brian Sims
What is a 3D Basemap?

- 3D Buildings
- Trees
- Water Bodies
- Basemap
- Terrain
Creating Your 3D Basemap

Dan Hedges
Local Government 3D Basemap Solution

Lidar (minimum ground classified)

Building Footprints

File01.las
File02.las
...
File99.las

Local Government Information Model

Elevation, Roof and Tree Parameter Extraction

Procedural Rules

Basic Scene

Schematic Scene

Realistic Scene
Local Government 3D Basemap Solution

• Task-based workflows
  • Documentation in tasks and online

• Semi-automatic generation
  • Automatic extraction of main roof form and trees
  • Procedural representation
  • Confidence measurement
  • Manual clean-up for complex roofs

• Quality depends on building footprint accuracy and Lidar point density
  - > 3 feet point spacing → LOD1 buildings
  - < 3 feet point spacing → LOD2 buildings
Roof-Form Extraction for Procedural Building Modeling

- Extract information about roof shape and height from lidar-derived surfaces
- Symbolize buildings in 3D using procedural rules
- Review output against LAS dataset
Automated Roof-Form Extraction for Schematic Buildings

- Classify areas of like slope & aspect in DSM
- Create roof-plane polygons
- Extract attributes
Procedural Modeling

- Ridge Height
- Eave Height
- Base Elevation
- Ridge Direction
- Roof Form: Gable
Procedural Modeling

- Roof types automatically classified

  - Flat
  - Gable
  - Hip

- Other types supported:
  - Shed
  - Dome
  - Vault
  - Mansard
Reviewing Output

- Prioritize review based on confidence metrics
- Compare procedural symbols directly against lidar
  - Manual changes update on-the-fly
Demo: 3D Basemap Creation In ArcGIS Pro
Maintaining + Sharing Your 3D Basemap

Brian Sims
Maintaining + Sharing Your 3D Basemap
Maintaining + Sharing Your 3D Basemap

Best Practices

First Capture

Second Capture

Extract New Building

Feature Extraction
Maintaining + **Sharing** Your 3D Basemap

**Best Practices**

**ArcGIS Online**

- **ArcGIS Pro**
  - Create Scene Layer
  - Share Web Scene

- **Scene Layer**
  - Package
  - Zipped GDB

- **ArcGIS Online**
  - Scene Layer
  - Feature Layer
  - Web Scene

**Desktop**

**Web**

**Devices**
Maintaining + Sharing Your 3D Basemap

Best Practices

Portal for ArcGIS

ArcGIS Pro
Share as Web Layer

ArcGIS Pro
Share Web Scene

Portal for ArcGIS

Scene Layer

Feature Layer

Web Scene

Desktop

Web

Devices
Maintaining + Sharing Your 3D Basemap

Best Practices

*Share Multipatches in Pro with layer in a Map or in 2D Features section of a Scene
Understanding + Engaging with Your 3D Basemap
How to Get Started
How to Get Started

Local Government Solutions

Local Government 3D Basemaps
Publish a collection of local government 3D basemaps that serve as a foundation for desktop, mobile and web mapping applications.

Planning and Development
Review Proposed Developments
A collection of maps and apps used to visualize proposed developments and assess the impact of each new development on the existing community.

Basic Scene  Schematic Scene

Visualize Proposed Development  Conduct Visibility Assessment
3D Enablement Workshop
Organized as a phased set of workshop activities

Dive deep into working with 3D in ArcGIS
• Learn advanced 3D workflows and techniques
• Hands-on, one-on-one
• Your data in your environment
• Align with a current project for immediate ROI
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Tuesday
Authoring 3D Scenes in ArcGIS Pro | 9:30 am
3D Basemaps: An Introduction | 12:30 pm

Wednesday
Point Clouds and 3D Mesh | 12:30 pm

Thursday
3D Enable Your Campus and Workplace | 9:30 am
Refining 3D Buildings Extracted from LiDAR | 12:30 pm

Creating and Sharing Awesome 3D Web Scenes
ArcGIS Pro: 3D Tips and Tricks