

# Building 3D GIS Applications for the Browser Using JavaScript

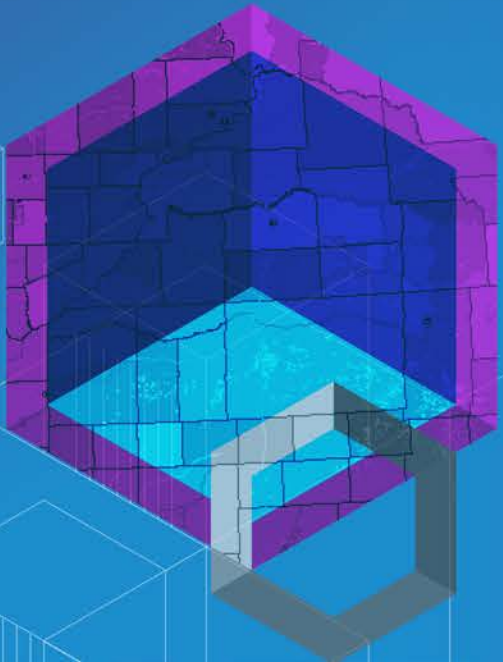
Janett Baresel & Pascal Mueller  
Esri R&D Center Zurich



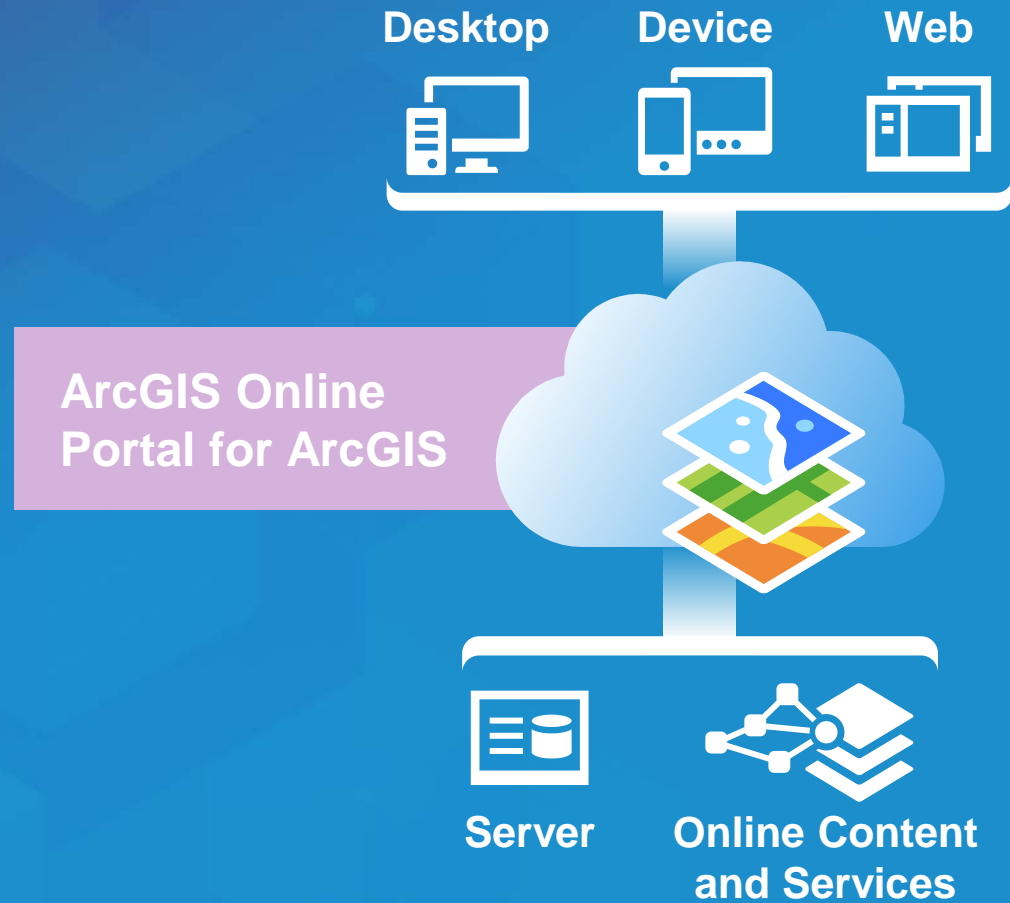
esri

# Introduction

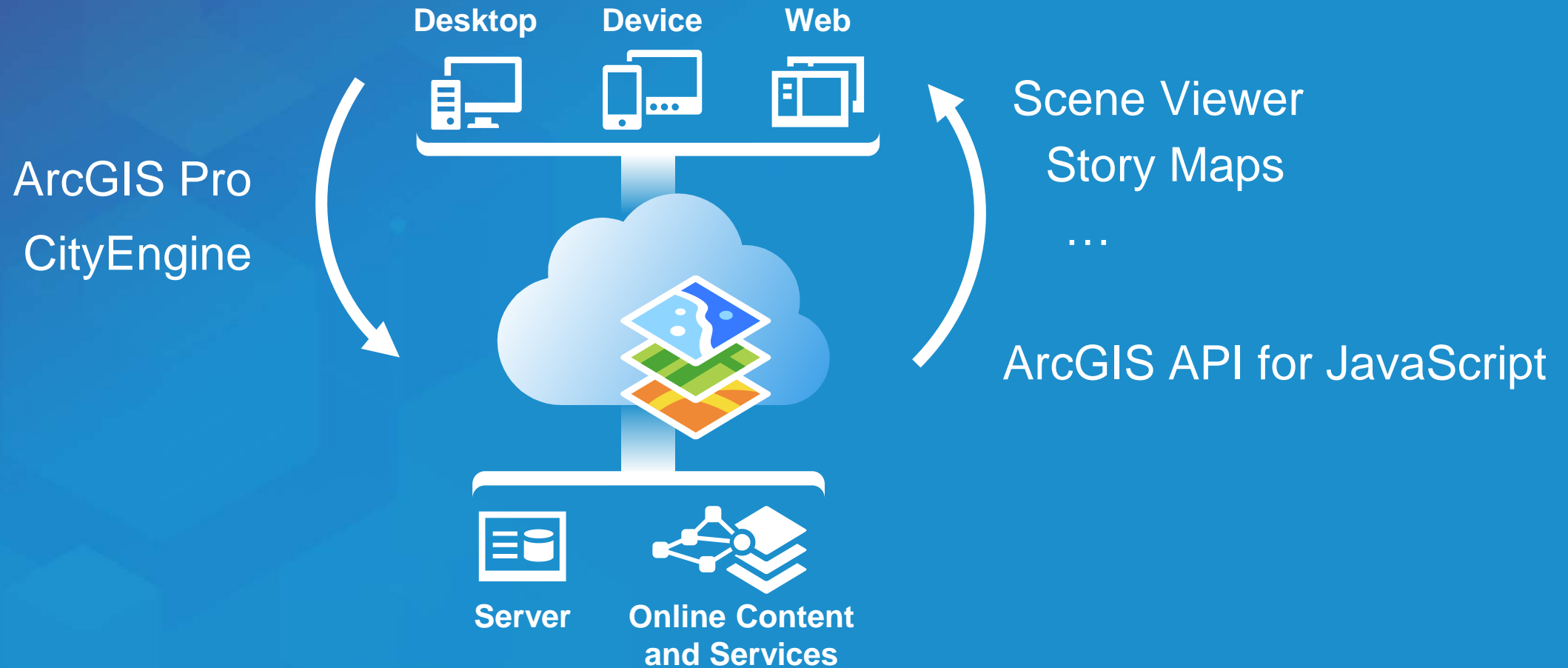
3D in the Browser with the ArcGIS Platform



# The ArcGIS Platform – Overview

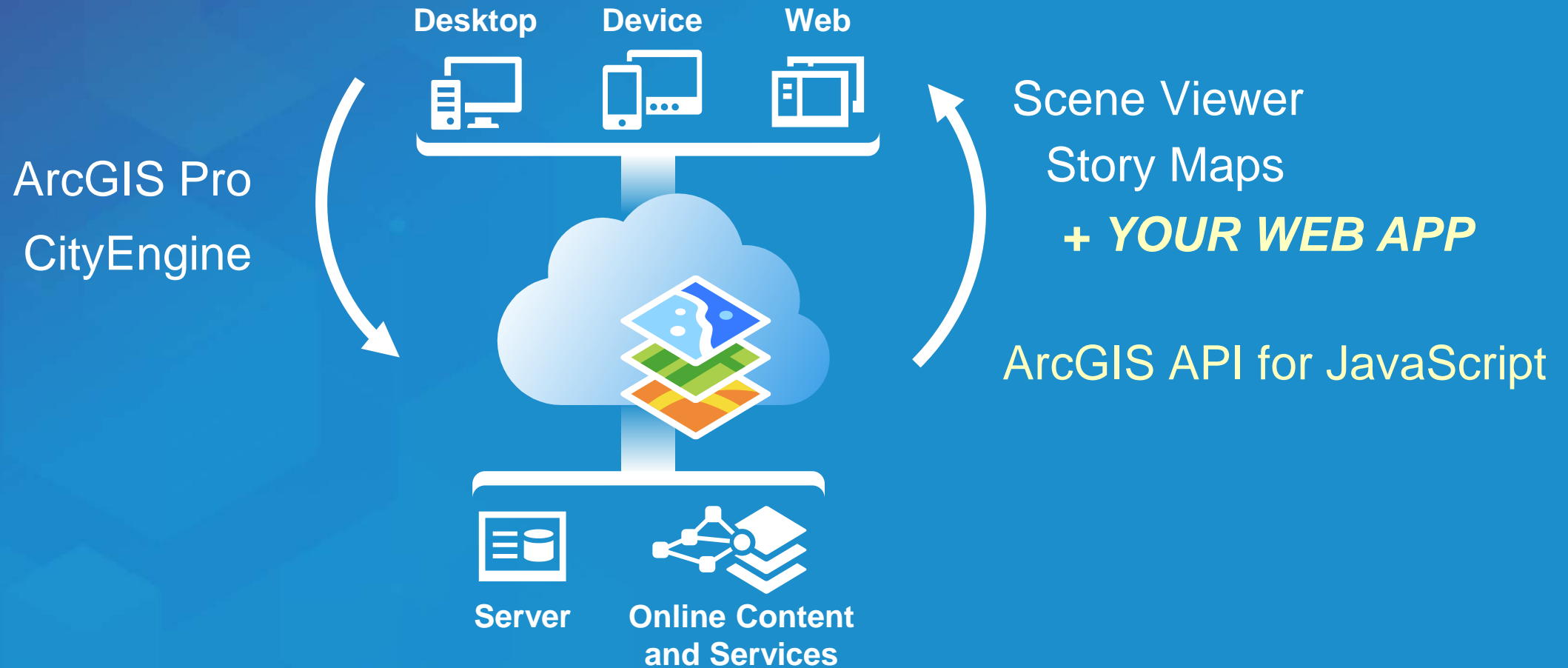


# The ArcGIS Platform – 3D Web Layers



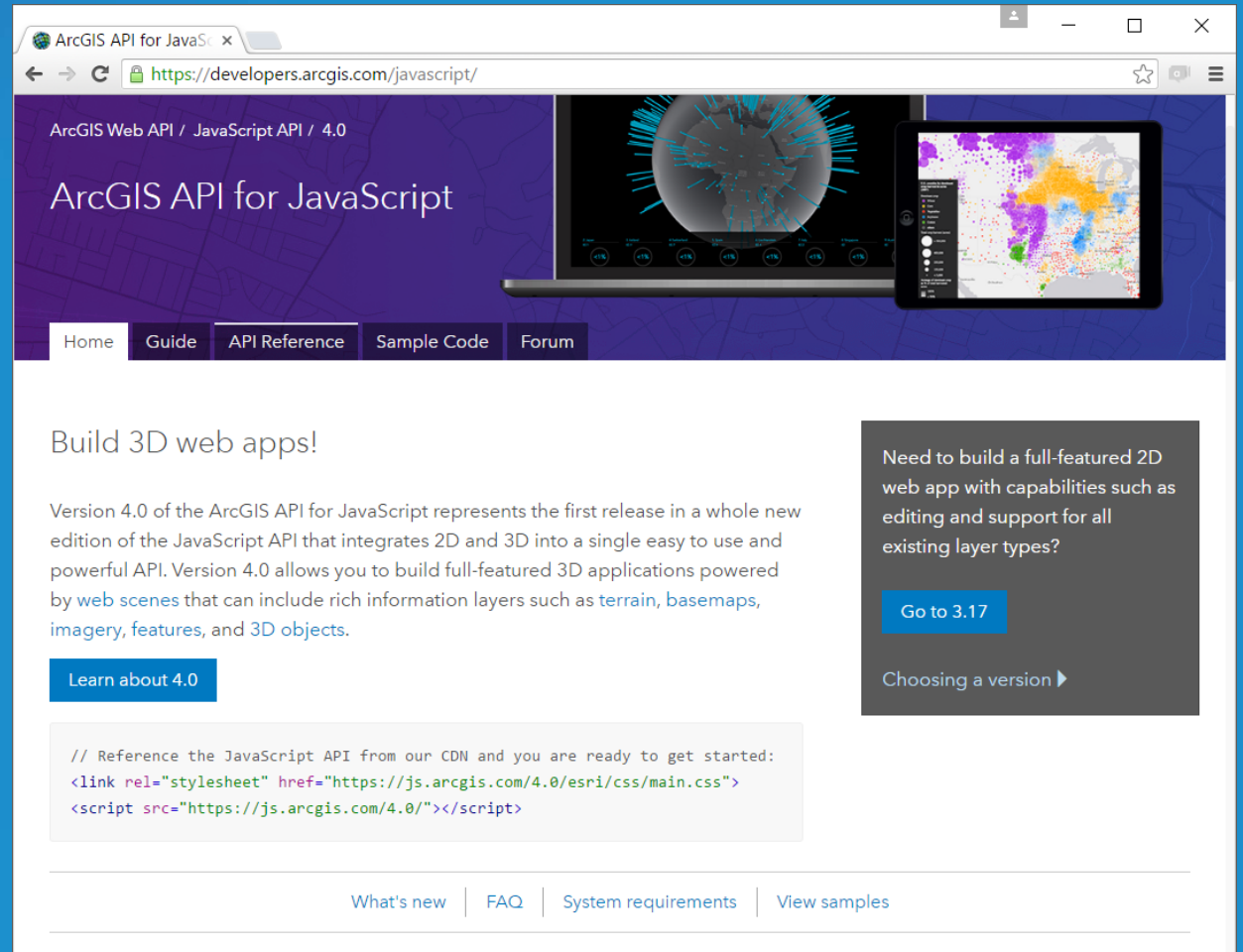
# *Demo* 3D in the Browser

# The ArcGIS Platform – 3D Web App Development



# The ArcGIS API for JavaScript

- Provides visual mapping component & widgets
- Support for many different layer types (data sources)
- Integration with ArcGIS platform (security, sign-in, premium services, ...)



# 3.x & 4.x

## 3.x: the good old JS API

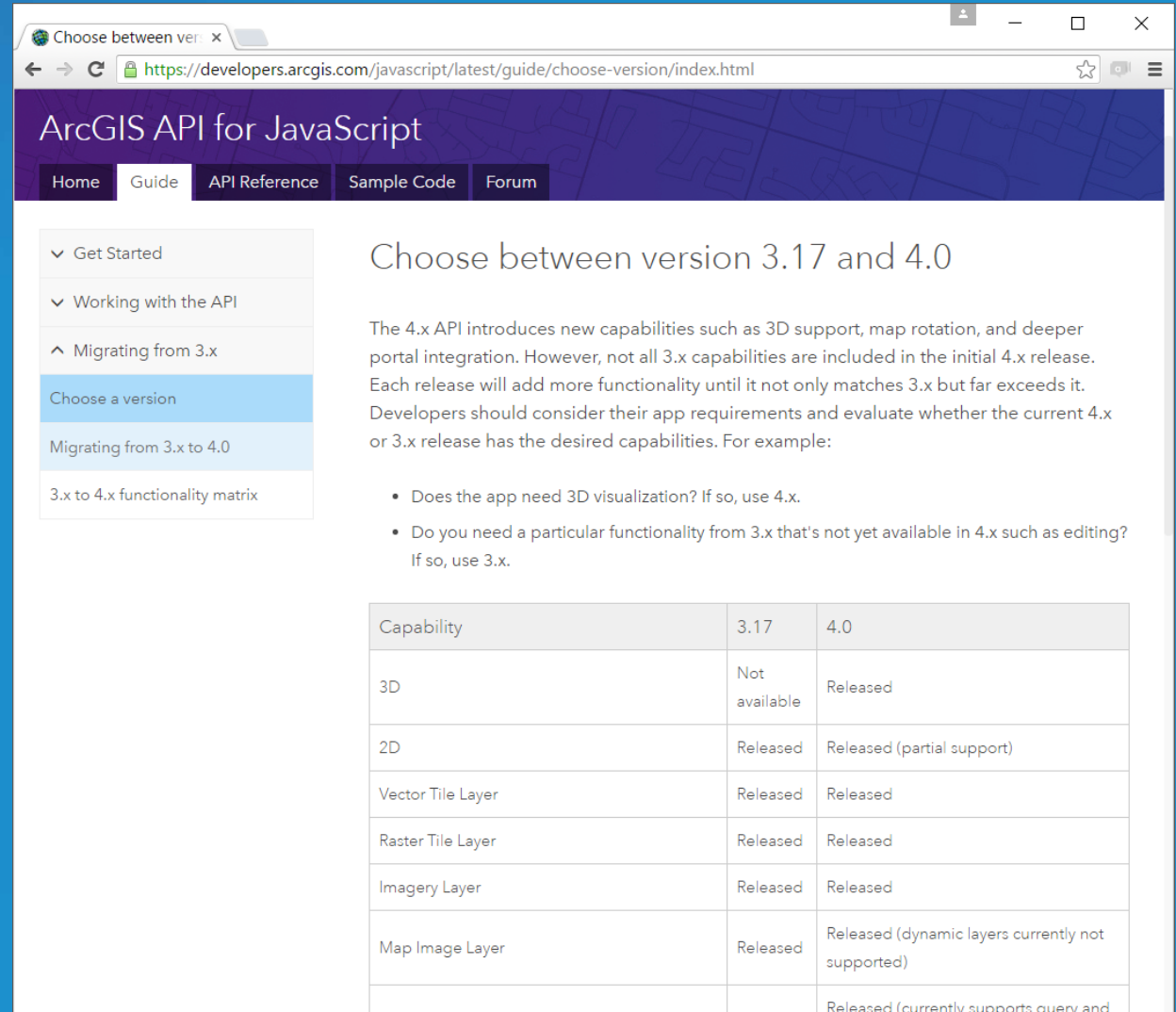
→ Not all 3.x capabilities are in 4.x yet

## 4.x: a new, modern, lean API

→ rebuilt from scratch (dev since 2.5 yrs)

→ introduction of 3D

→ embracing layers / portal items e.g.  
high-level interfaces for Web Map  
and Web Scene



ArcGIS API for JavaScript

Home Guide API Reference Sample Code Forum

### Choose between version 3.17 and 4.0

The 4.x API introduces new capabilities such as 3D support, map rotation, and deeper portal integration. However, not all 3.x capabilities are included in the initial 4.x release. Each release will add more functionality until it not only matches 3.x but far exceeds it. Developers should consider their app requirements and evaluate whether the current 4.x or 3.x release has the desired capabilities. For example:

- Does the app need 3D visualization? If so, use 4.x.
- Do you need a particular functionality from 3.x that's not yet available in 4.x such as editing? If so, use 3.x.

Capability	3.17	4.0
3D	Not available	Released
2D	Released	Released (partial support)
Vector Tile Layer	Released	Released
Raster Tile Layer	Released	Released
Imagery Layer	Released	Released
Map Image Layer	Released	Released (dynamic layers currently not supported)
		Released (currently supports query and



# Introducing 3D

## Data

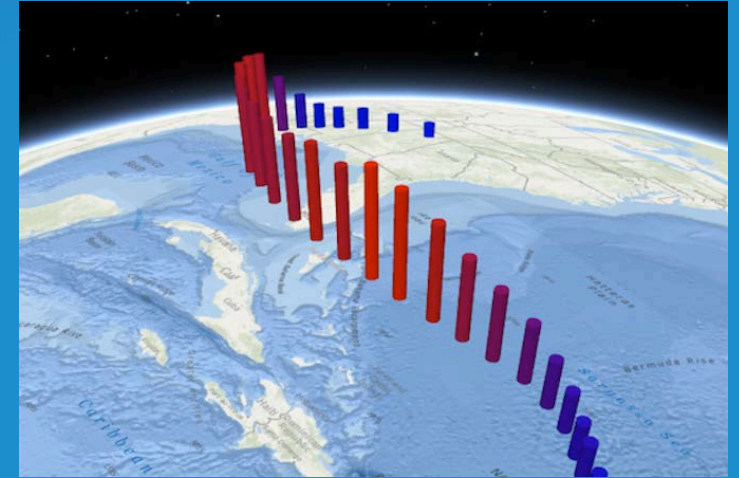
- 2D tiles, maps, **elevation**, features
- **Scene layers** (open i3s format)
  - 3D Objects, Integrated Meshes, Points

## 3D concepts

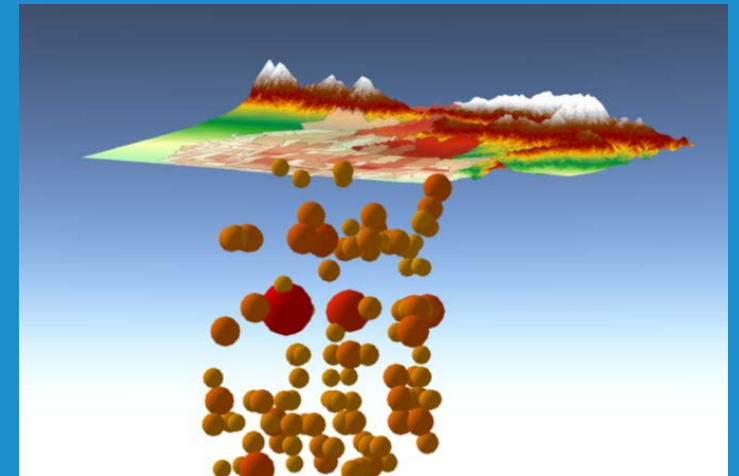
- **Local & global** scenes
- **Ground** surface with elevation
- **Camera**, light and shadows

## Requirements

- Modern web browser w/ **WebGL** (IE11+)
- Modern hardware w/ Graphics Card



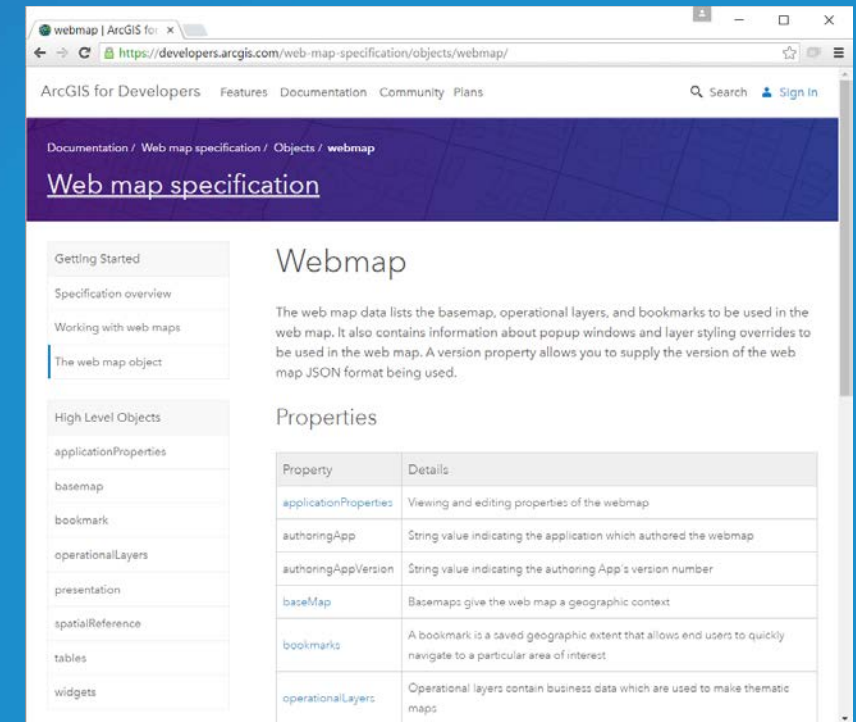
Global: geographic, global extent, spherical



Local: projected, local extent, planar

# Web Scene

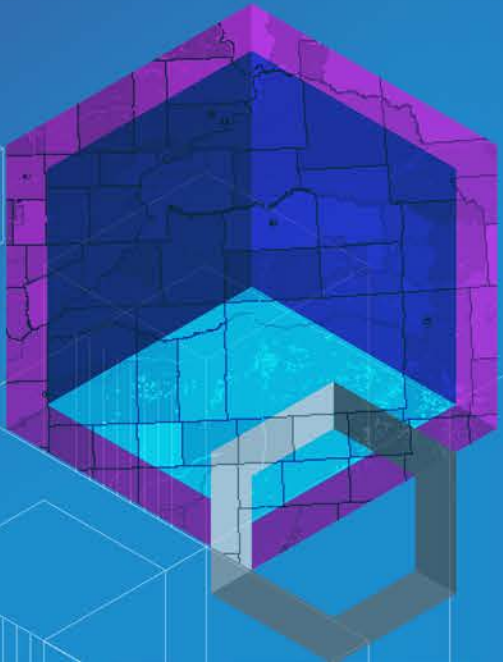
- Defines the content of a 3D Scene
- Serialized as JSON
- Stored in Portal/Online
- JSON spec similar to Web Map
  - Operational layers (with styling overrides)
  - Base map, slides, initial state (position and light)
  - Metadata: scene type, spatial reference, version...
- Across the platform
  - ArcGIS Pro, JS API (= Scene Viewer, Story Maps, Web AppBuilder, ...) & RT soon



Web Scene specification documentation in fall 2016

# 3D Layers

Preparing 3D Web Layers using Pro and CityEngine

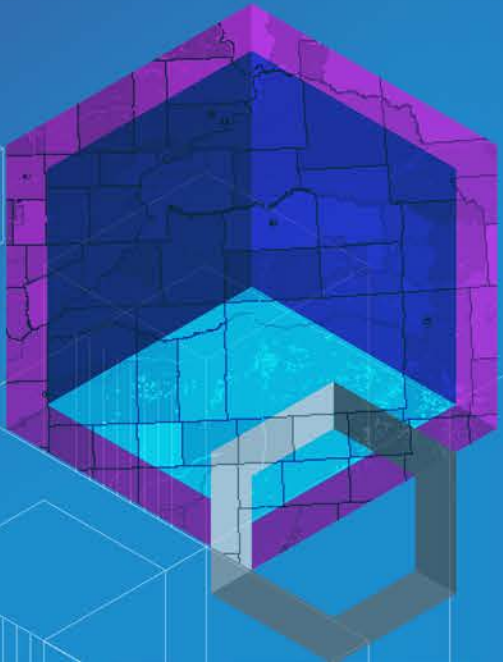


# *Demo* ArcGIS Pro

*Demo* CityEngine

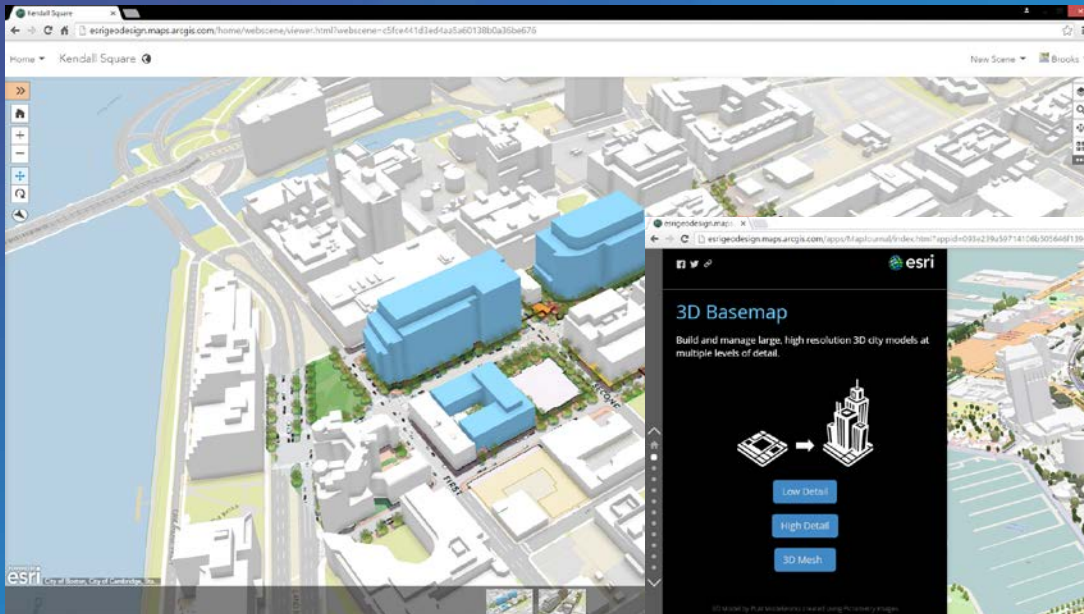
# Why?

The Need for Developing Custom Web Apps

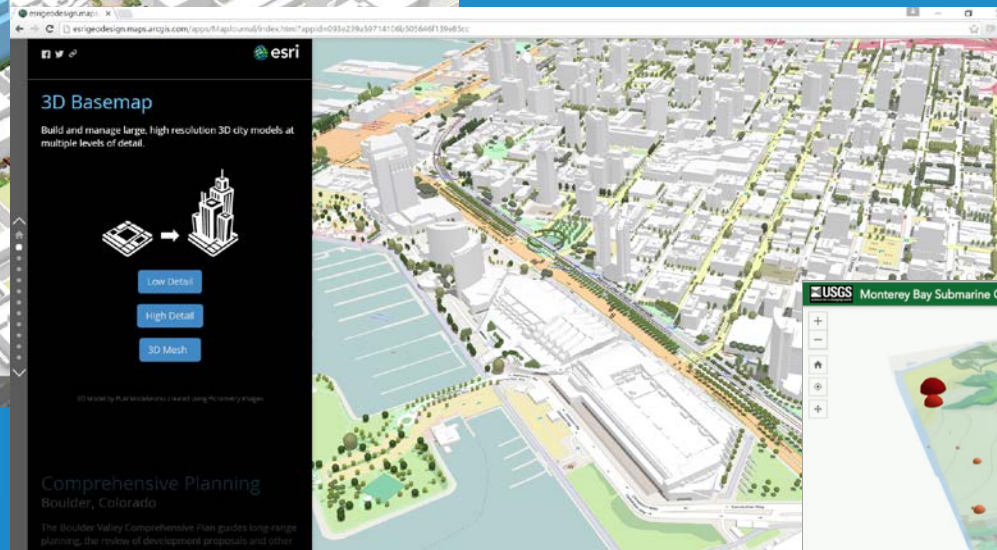




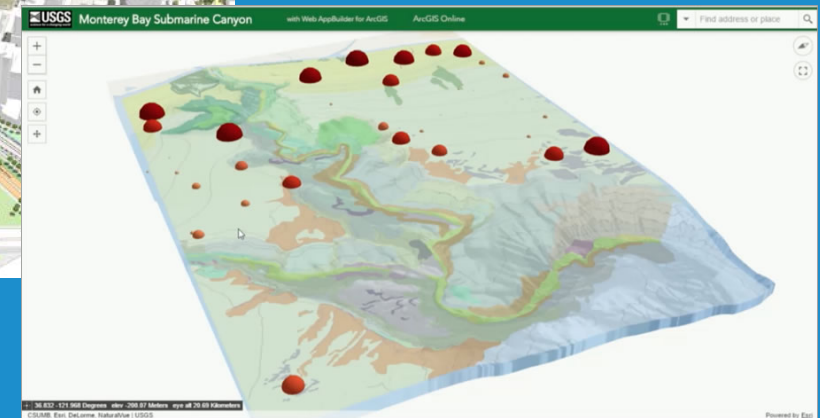
# Esri Provides General-Purpose Apps



Scene Viewer

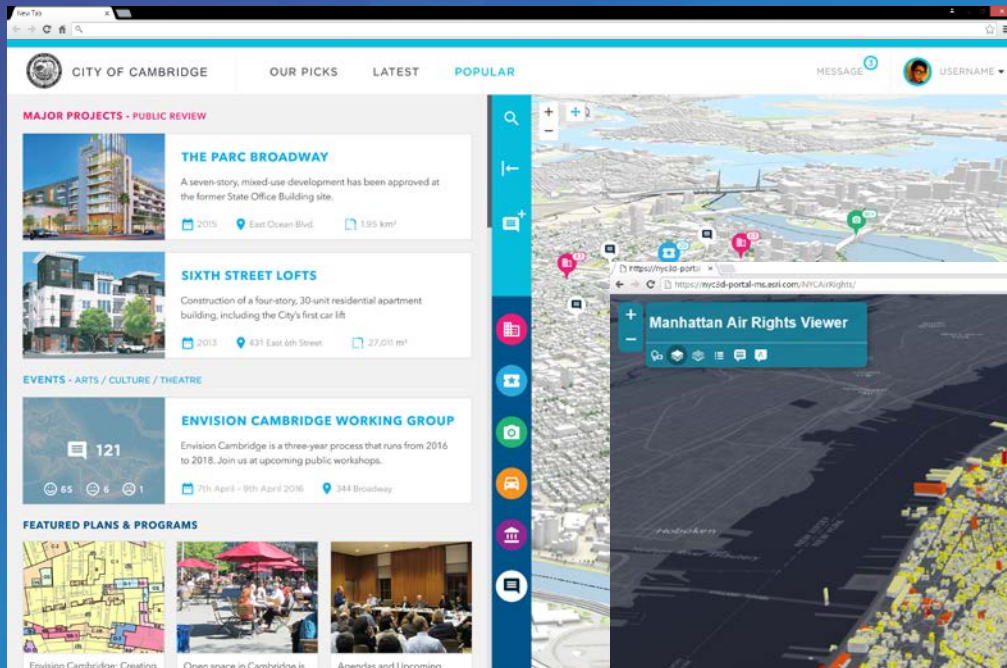


Story Maps



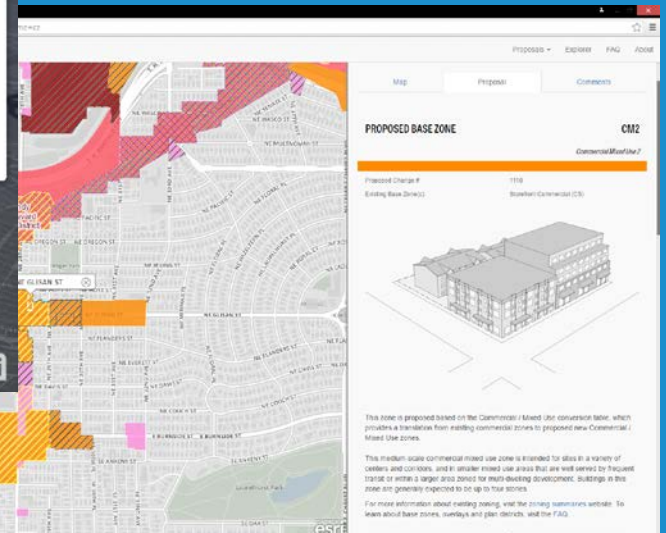
Web AppBuilder ...

# Build Your Own Special-Purpose Apps



Add news/social feeds,

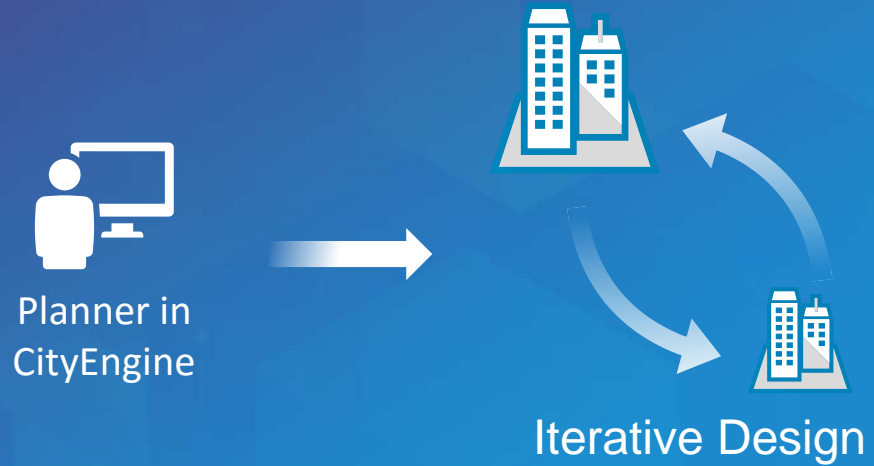
filter/reporting functionality,



special UI elements, etc ...



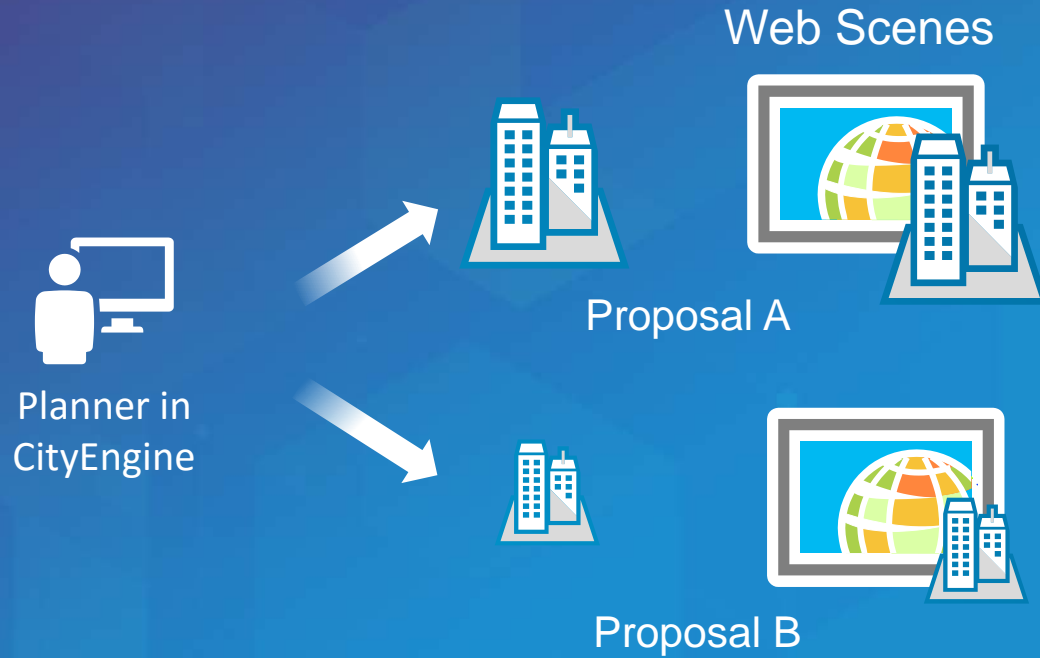
# Use Case Example



Back Office

Data Management, Planning, and Design

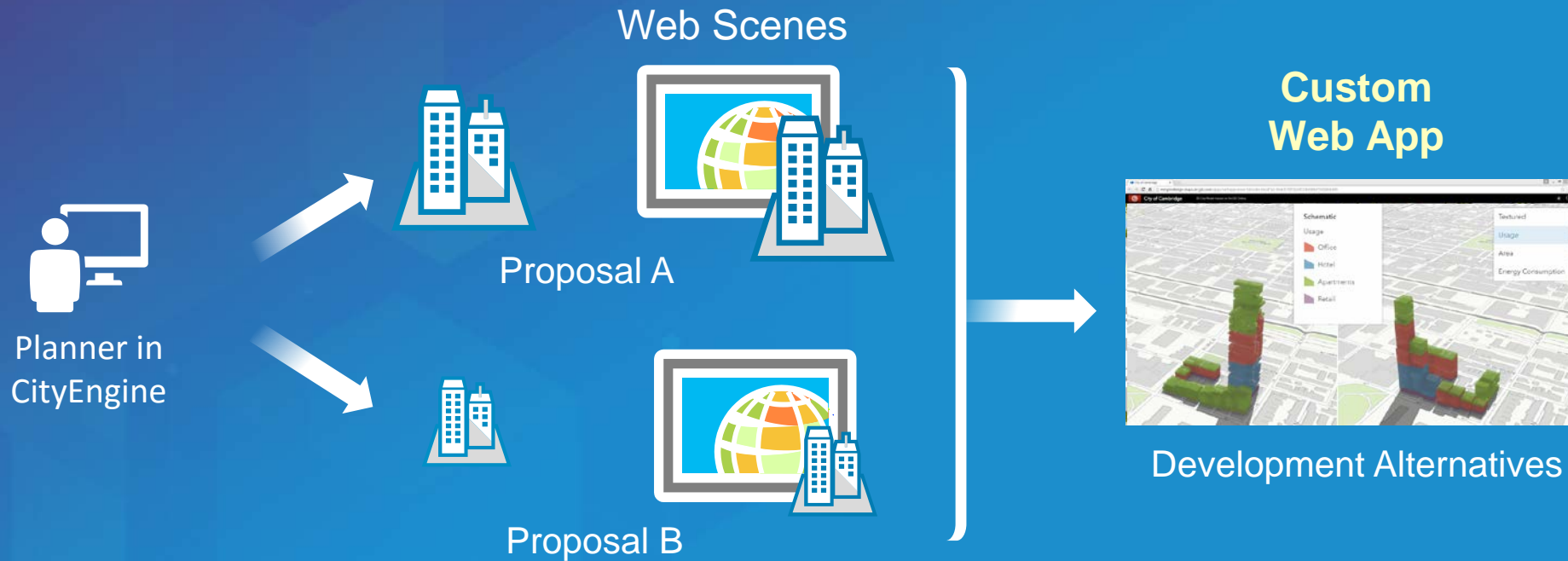
# Use Case Example



Back Office

Data Management, Planning, and Design

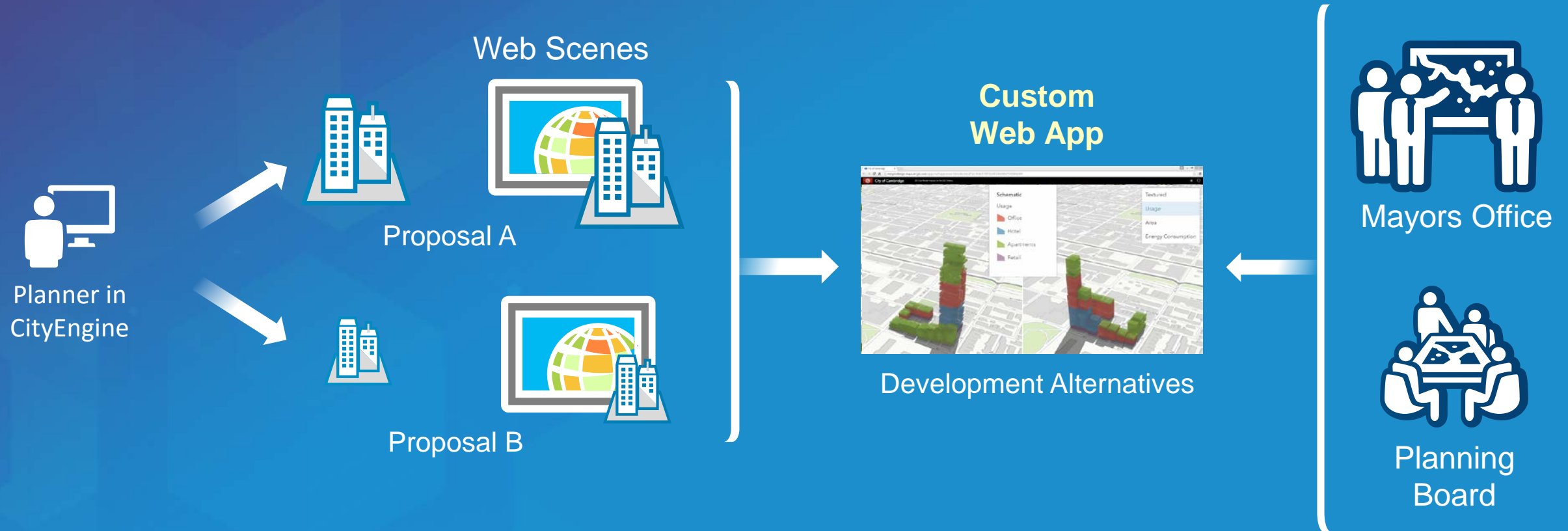
# Use Case Example



Back Office

Data Management, Planning, and Design

# Use Case Example

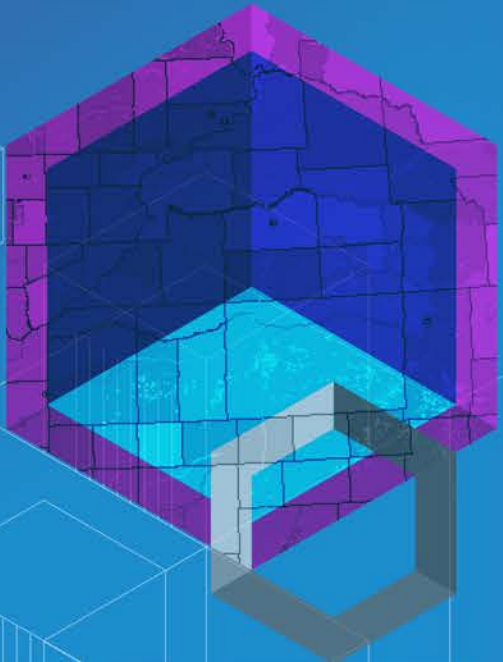


**Back Office**  
Data Management, Planning, and Design

**Front Office**  
Key Stakeholder Communication & Decision Making

# Development

A Step-by-step Example on How to Code a 3D Web App



# *Demo* ArcGIS JS API





# Q & A



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