

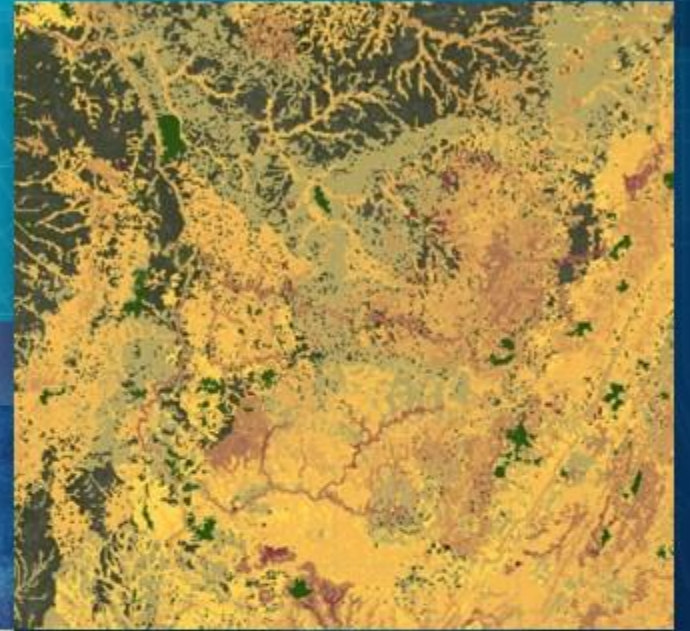
Enabling Digital Innovation & Delivery

GIS in AEC

Joseph J. Kerski, PhD GISP

jkerski@esri.com

www.josephkerski.com





What if...we could break down the traditional barriers in engineering projects that **stovepipe projects, slow down progress** and **generally provide negative value to projects?**

OUR AGENDA

- 01 Trends in AEC**
- 02 Esri and Autodesk Alliance**
- 03 Building E Demonstration**



GIS and AEC

Trends and Directions

An aerial view of a modern transit station. In the foreground, there are several train tracks with overhead power lines. The station platform is visible, featuring a large, curved, glass-enclosed structure. In the background, there are several tall, modern buildings with grid-like window patterns. A construction crane is visible near one of the buildings. The sky is overcast with grey clouds.

No. 1 GIS / AEC Priority Request...

Interoperability



AEC is an evolving sector!

Digital is disrupting how we think and deliver to our customers.

Esri is sharpening its focus on the AEC sector's unique requirements to provide customer-centric, project-based solutions.



Abstraction ...Abstraction ...Abstraction

BIM

Digitalization: Process and Data...





The Value of BIM in Construction

Construction Documentation
Scheduling
Costs
Safety
Visualization
Coordination



Design BIM

Record BIM

Trades BIM

"As-Maintained" BIM

As-Built BIM

Scan to BIM

Concept BIM

CONSTRUCTION BIM

Transportation BIM

**3D CAD w/
Attributes**

The Georelational Modeling ...

Public Health

Governance

Facilities

Safety

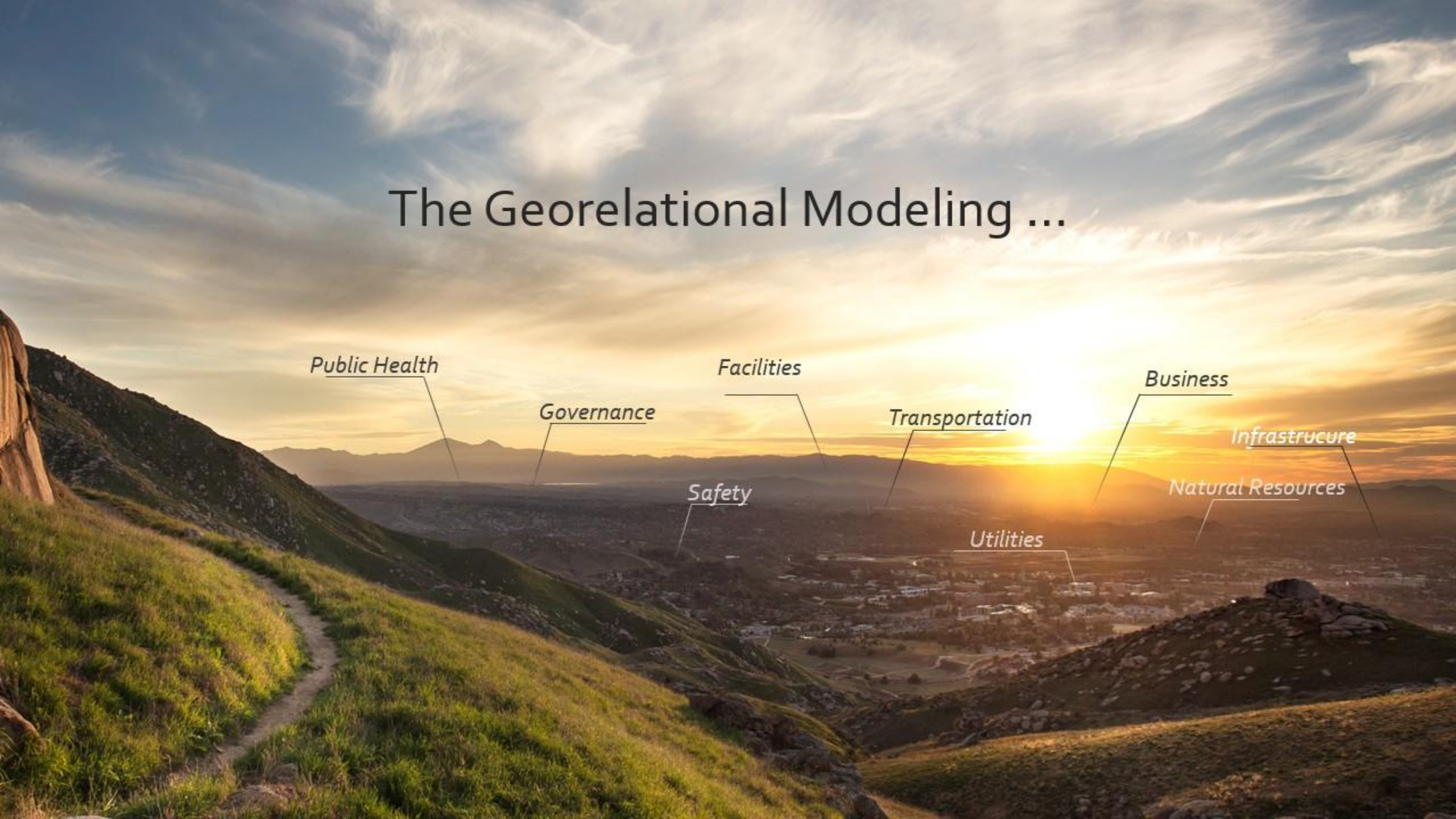
Transportation

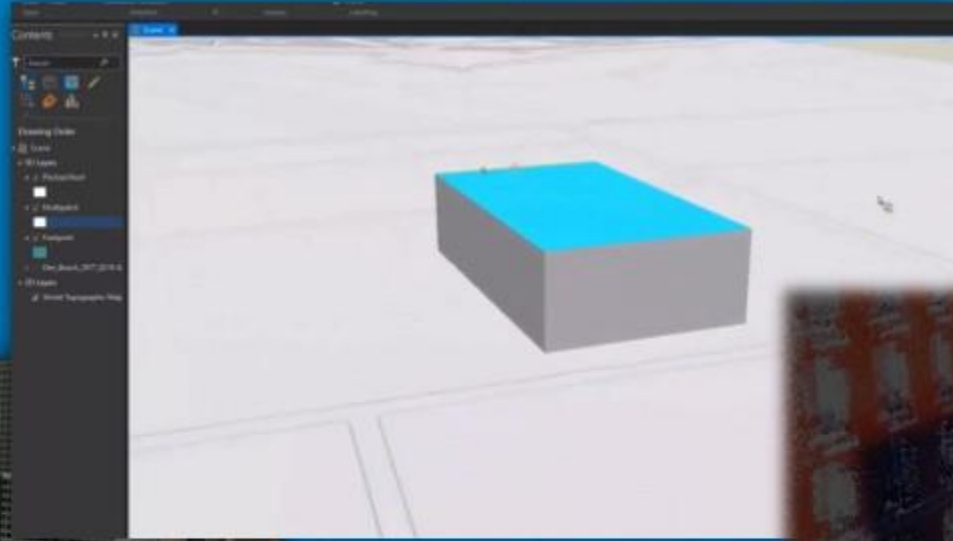
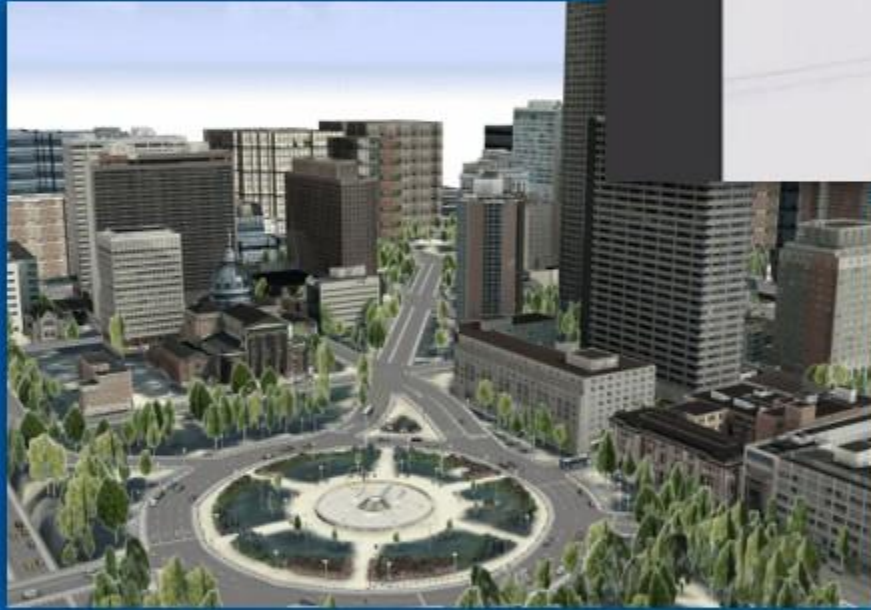
Utilities

Business

Infrastructure

Natural Resources



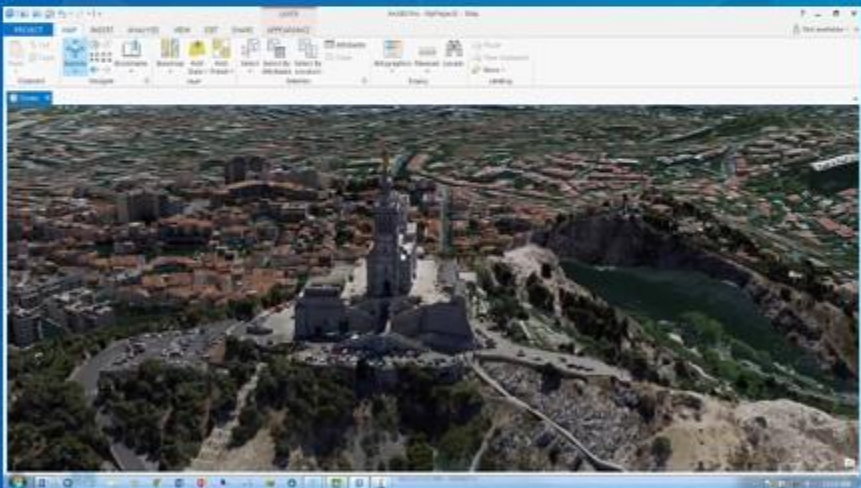




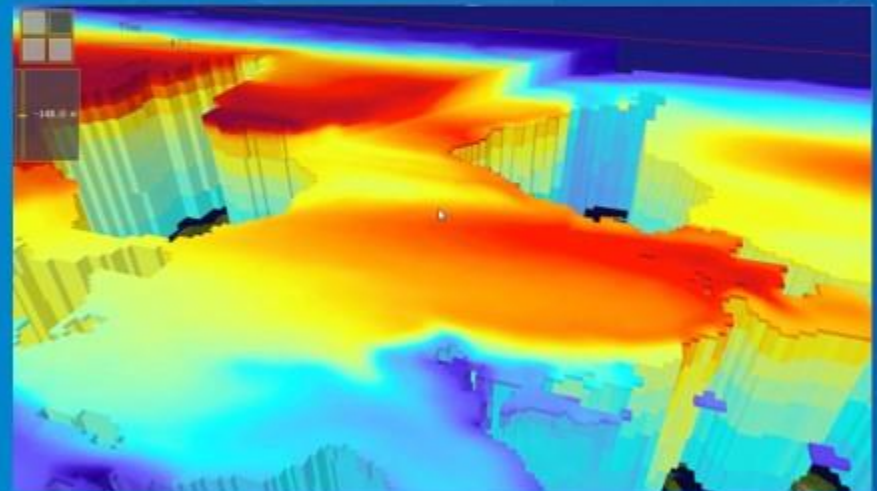
3D Objects



Point Cloud



Mesh



Voxel

AEC Integration Patterns....

File Exchange with disconnected stakeholders



CAD

Unstructured vs Structured...



EXPORT TO CAD

Create and Append to CAD Files

ArcGIS data in AutoCAD files (MSC)

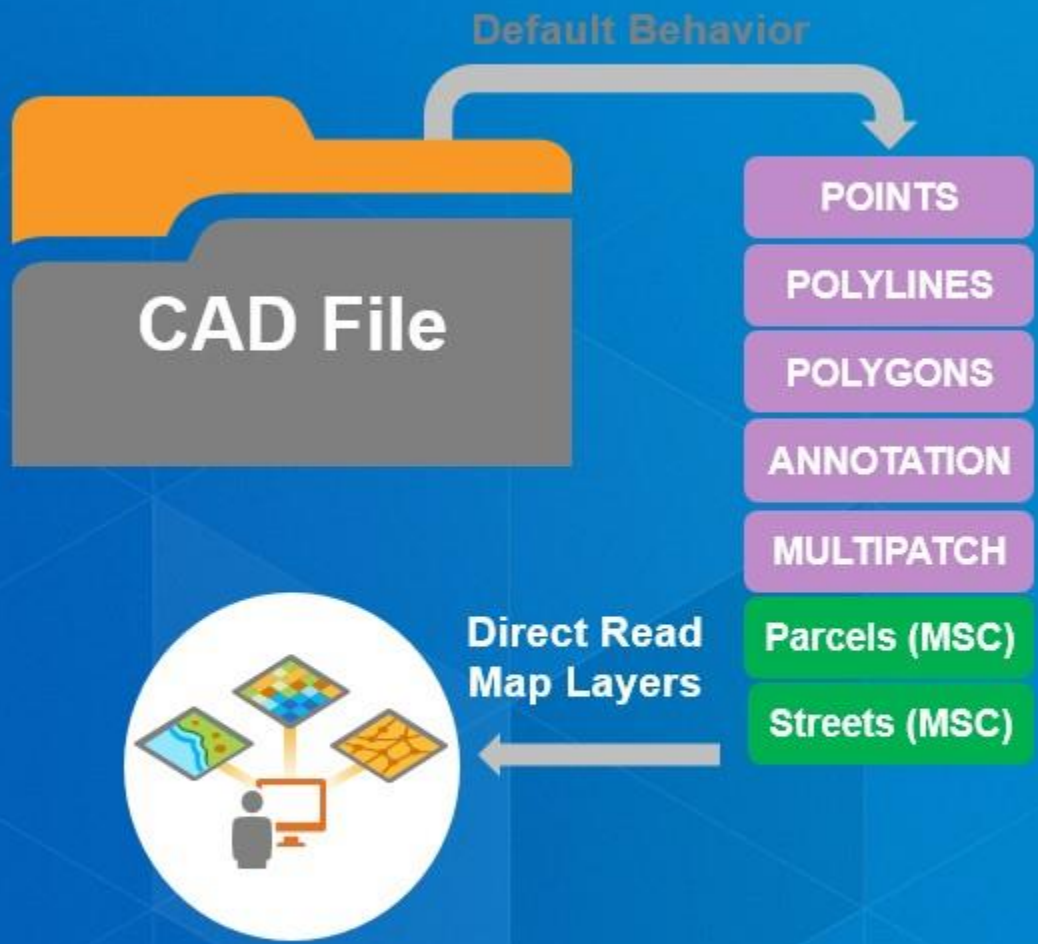
- Feature Classes
- Attributes
- Coordinate System
- Better than Shapefiles...

ArcGIS Desktop



DWG





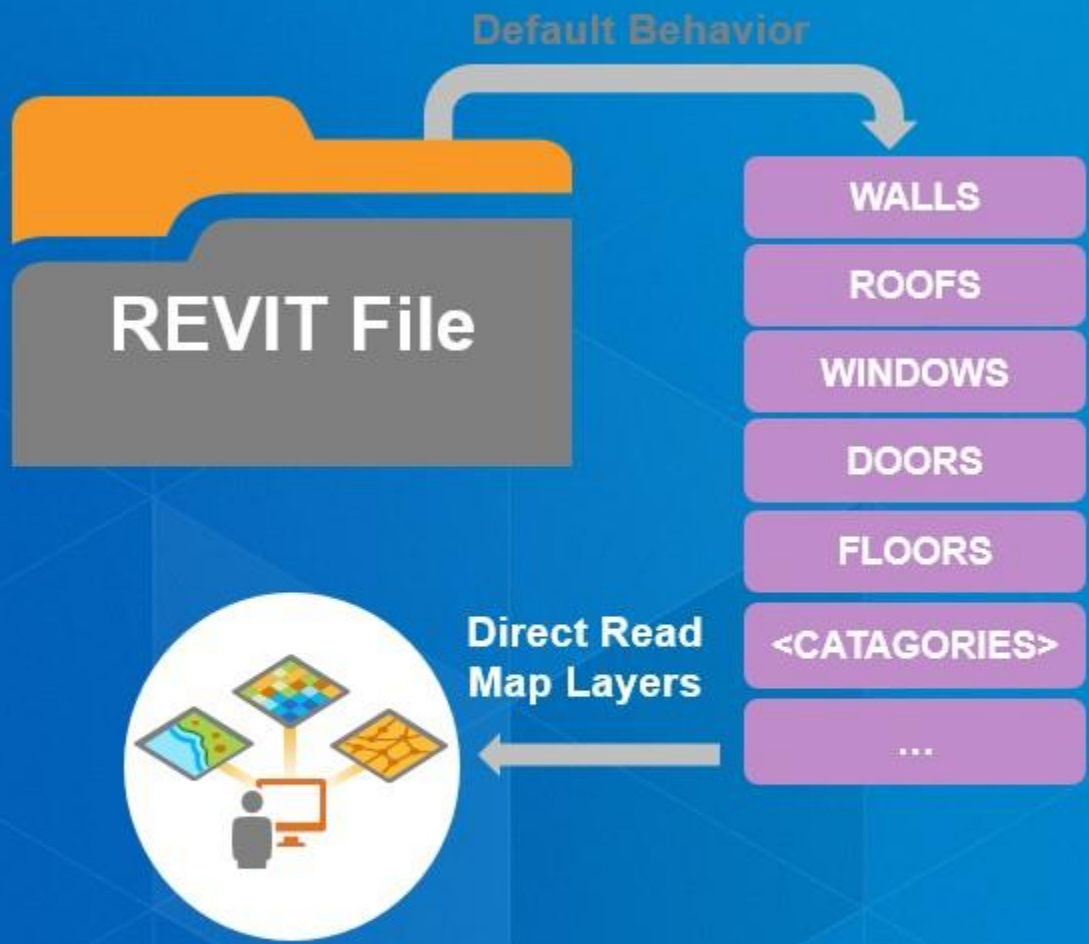


REVIT File



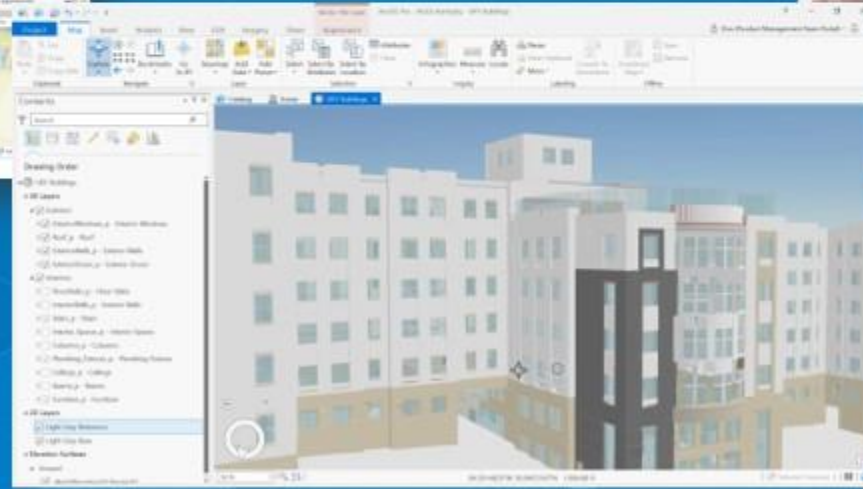
Adding REVIT Data in ArcGIS Pro

REVIT Reader



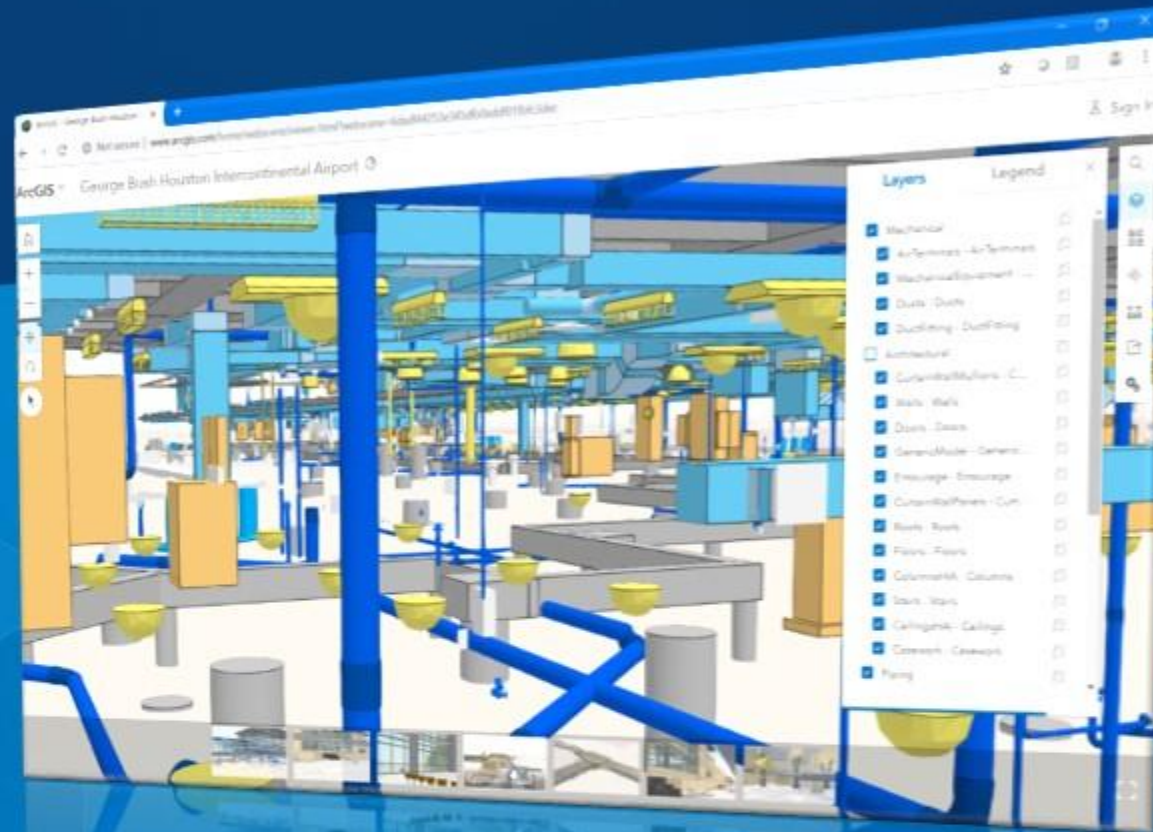
BIM and Building Layers GIS

Directly Reading CAD/BIM/AEC in ArcGIS Pro...



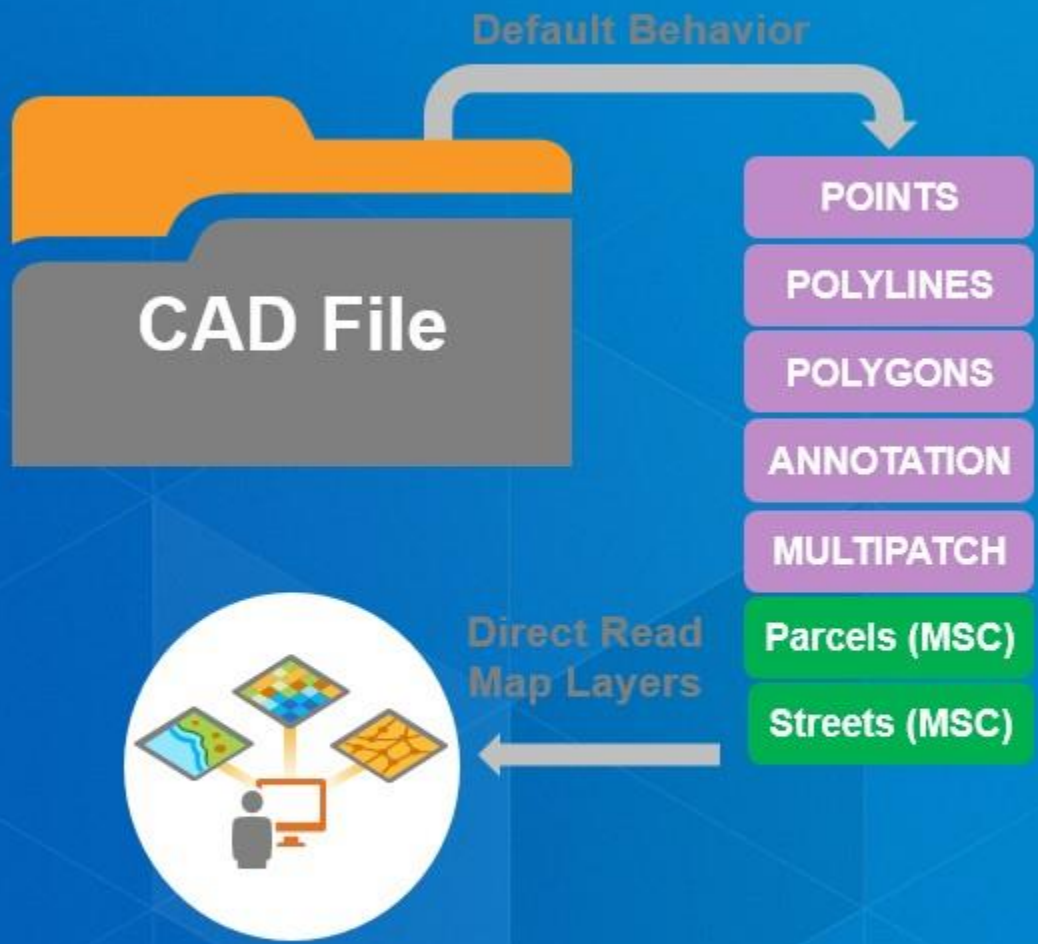


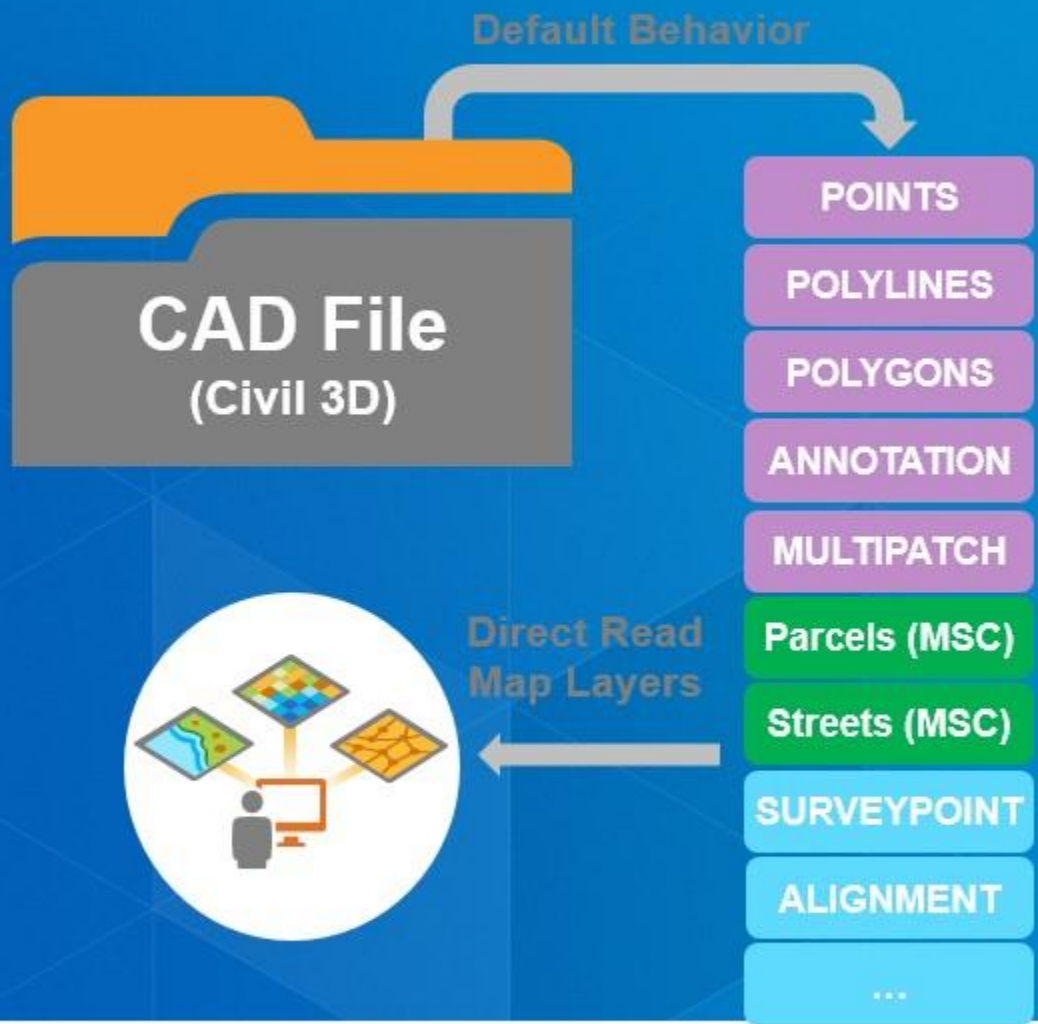
Scene Layers & BIM



BIM in Geoprocessing...

BIM and ArcGIS





AEC Integration Patterns....

ArcGIS Desktop



Desktops Browsers Devices



WebGIS

Design Software
Plug-ins

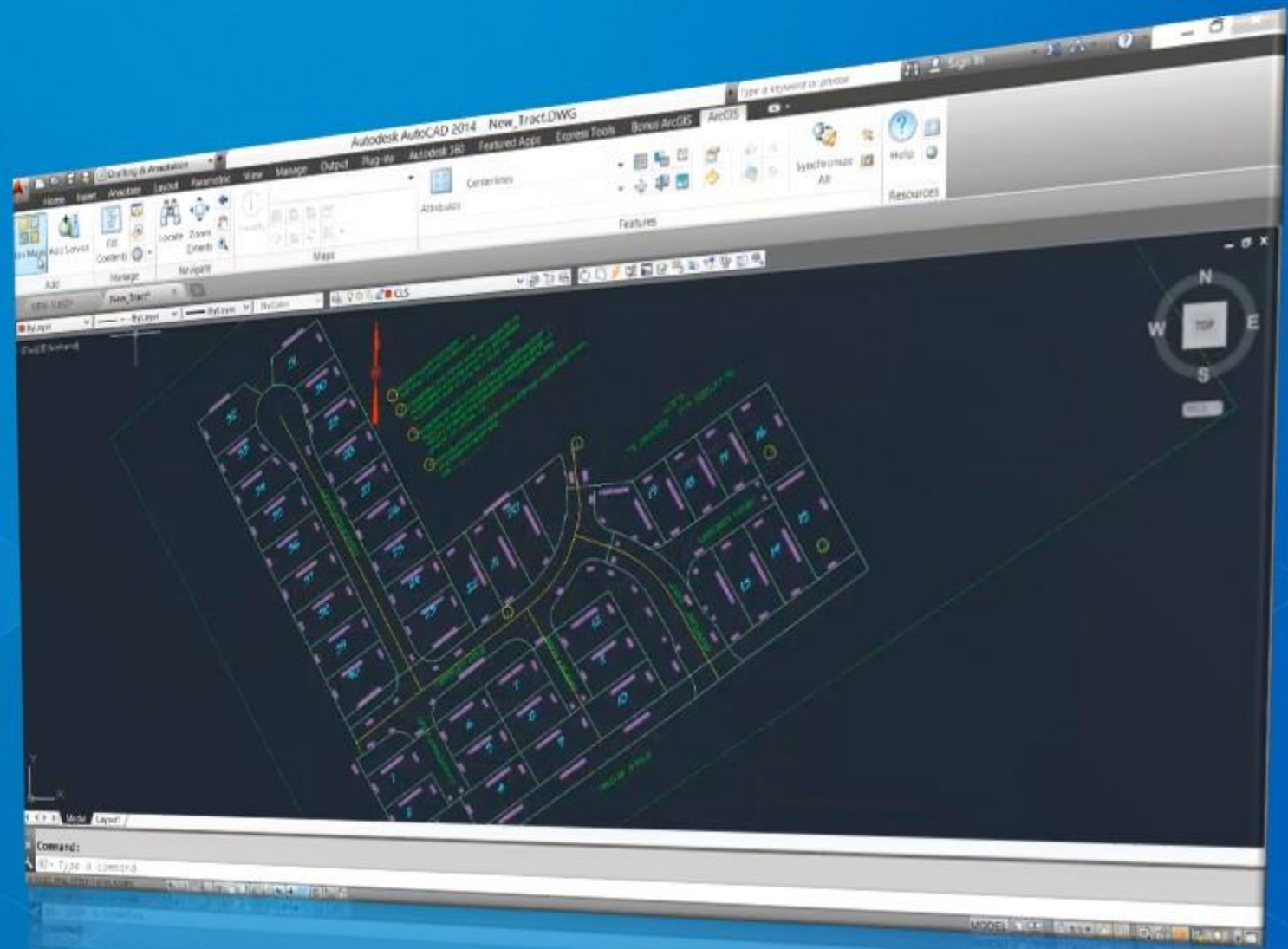


Services

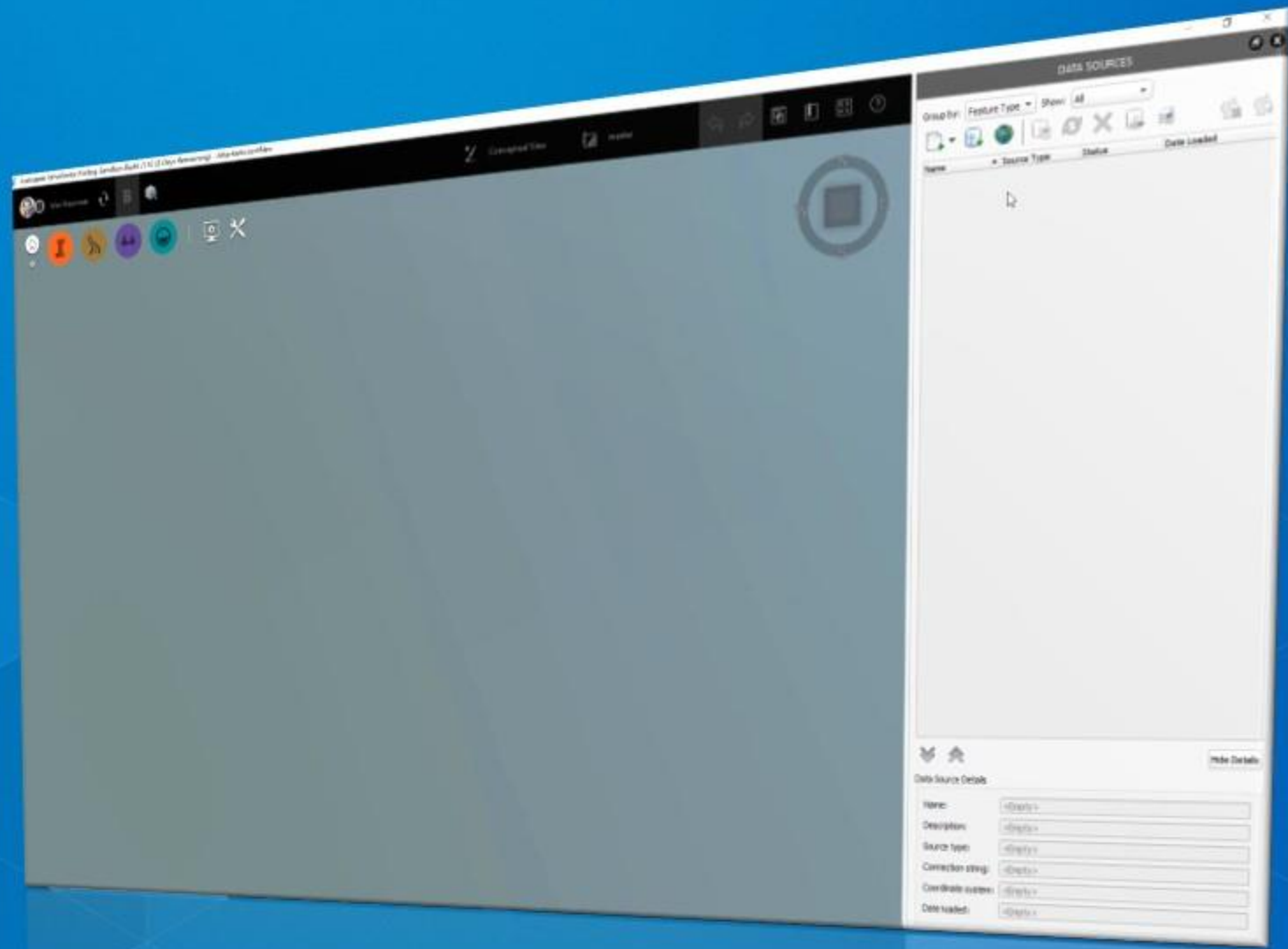
A AUTOCAD



ArcGIS for AutoCAD



ArcGIS for AutoCAD



AutoCAD Civil 3D, Infraworks

ArcGIS in the Field



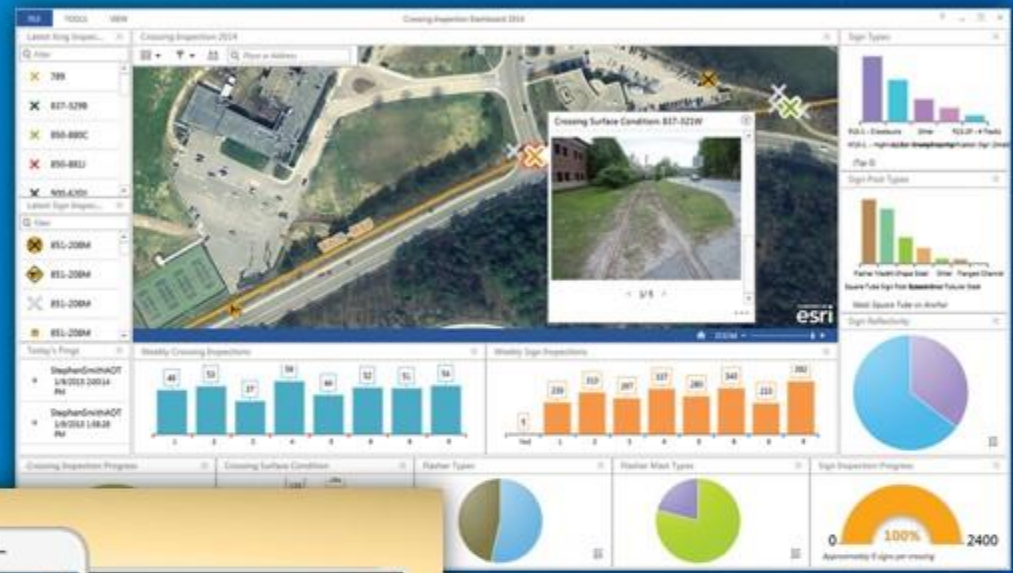
Critical Infrastructure



Enabling Project Delivery



Improve Operational Awareness



Collector for ArcGIS

Accurate Data Collection Made Easy

[Get Started](#)

Collect and Update Data in the Field

For mapping in the field or your field workflow to improve the accuracy and currency of your spatial data and make more timely and informed decisions.

How It's Used

From damage reports and service requests to inventory and inspection of assets, create and edit accurate data in the field.

- Collect and update information in the field and log.
- Use Collector for ArcGIS online or offline, regardless of location.
- Works on iOS, Android, and Windows.
- Supports external receivers for improved spatial accuracy.

GeoEnabled Systems = [Smart Assets + Project Delivery]



AEC Integration Patterns....

ArcGIS Desktop



Utility Network
Parcel Fabric
ArcGIS Indoors
ArcGIS Urban
R&H...

Desktops Browsers Devices



WebGIS

Design Software
Plug-ins



Services





Utility Network for AEC

Utility Network



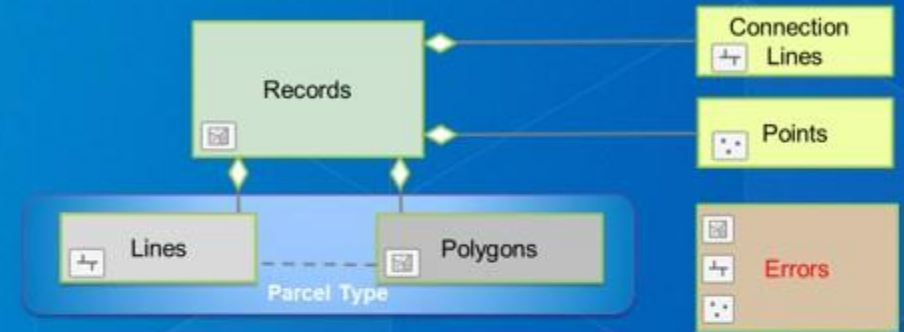
Parcel Fabric

System of Land Records

Tax Assessment, Transportation, ROW, Subsurface, Agriculture..

Legal AND Physical World

Historic Parcels and Parcel Lineage



A comprehensive framework for managing, editing, and sharing parcel data



Integration Patterns

Esri and Autodesk Alliance

DESIGN

GIS  esri +  AUTODESK BIM



Geography



Landscape Information Models



City Information Models

Engineering

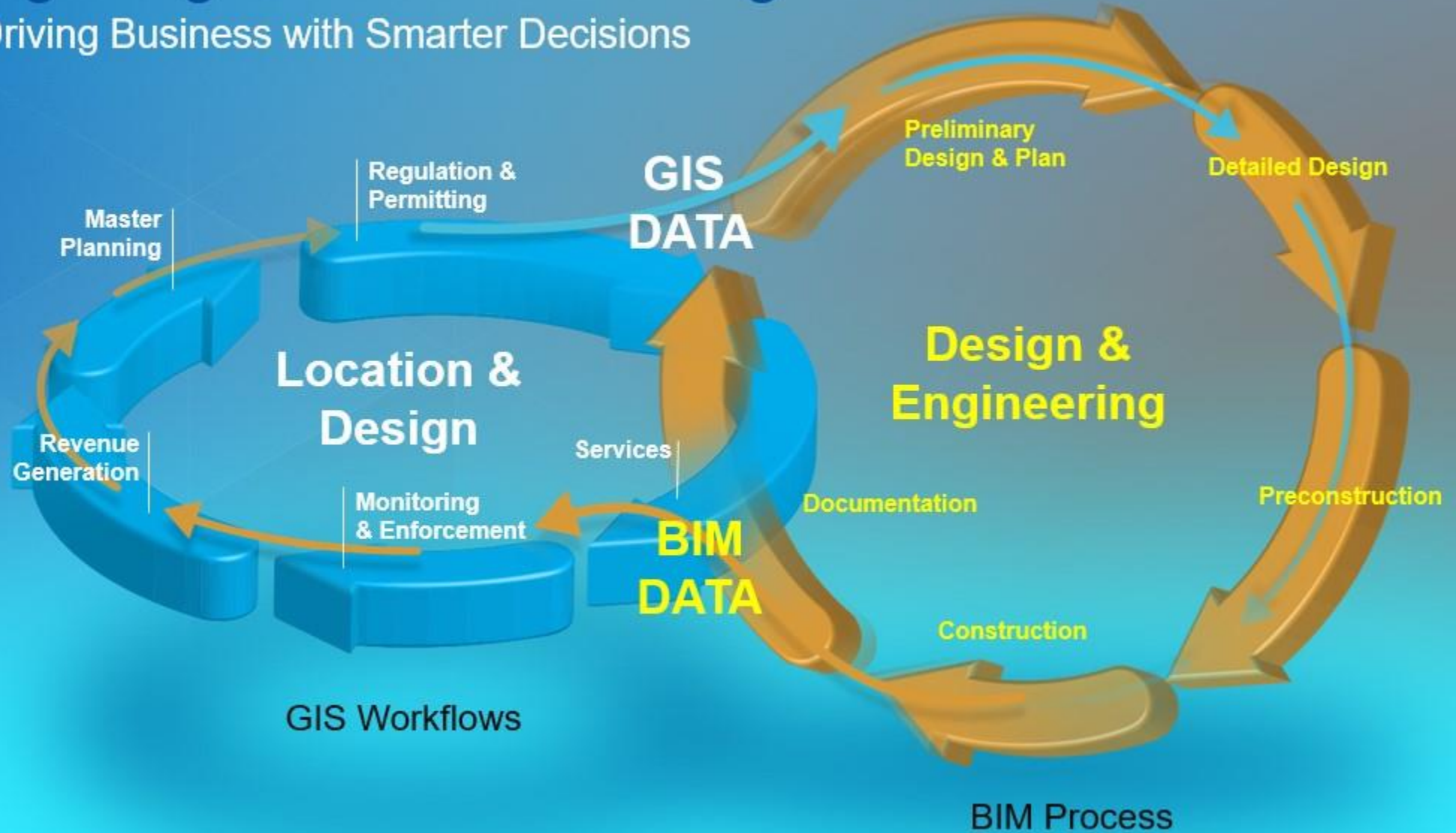


Building Information Models

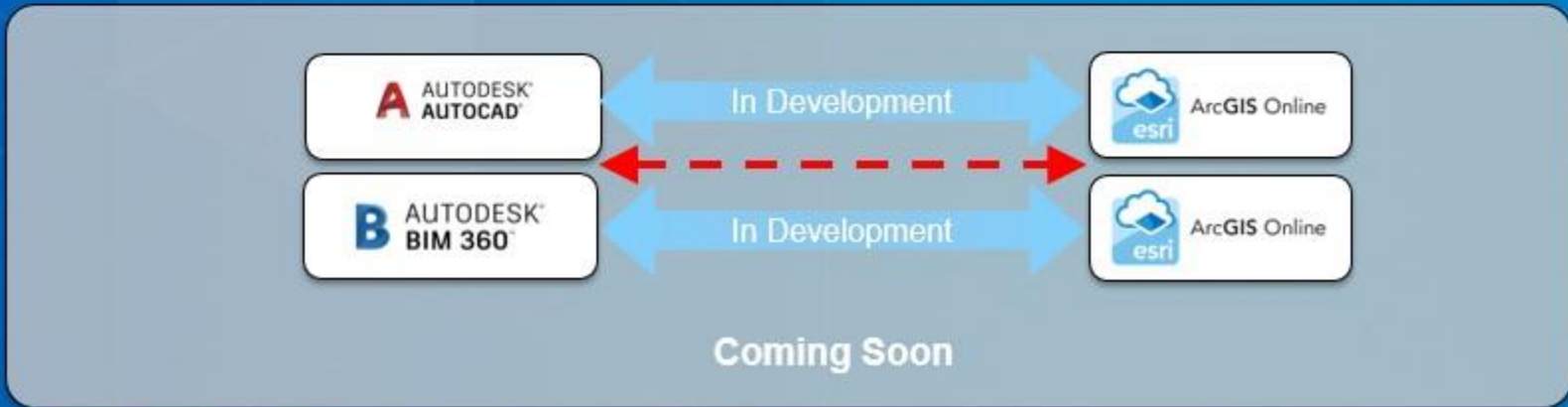
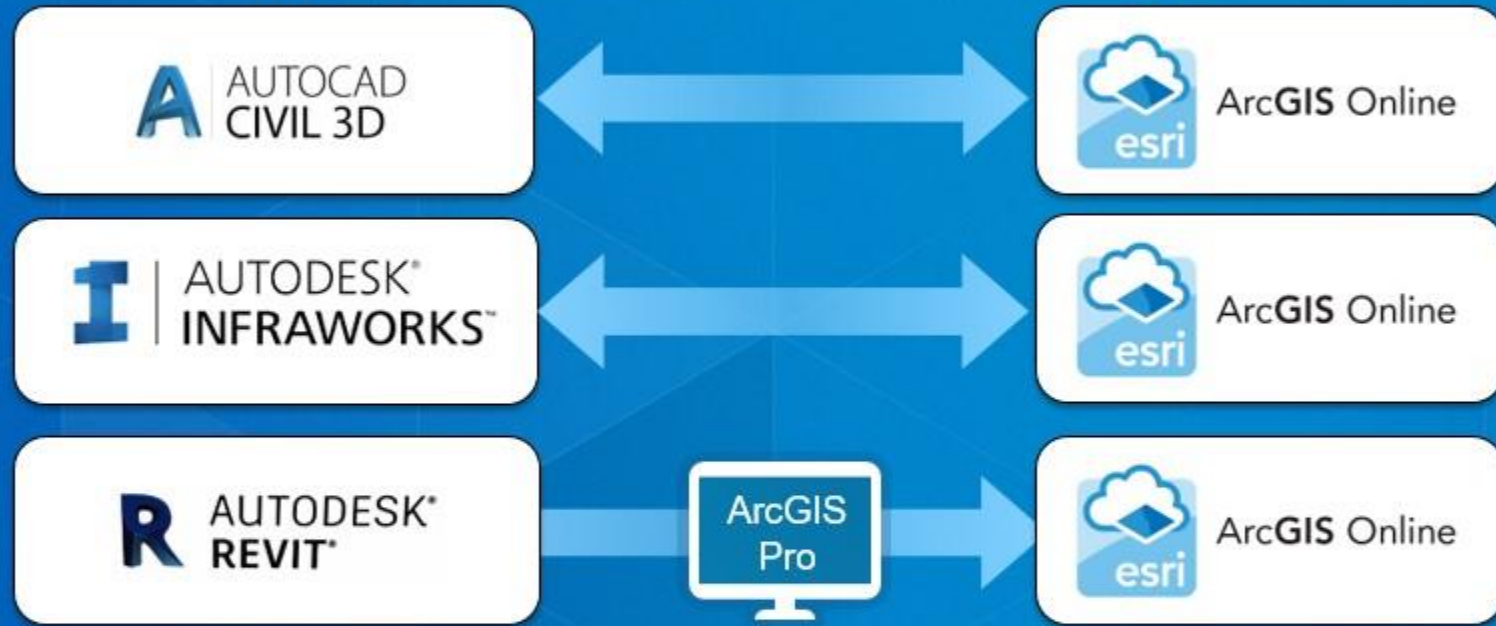
An Integrated and Holistic Approach

Integrating Location and Design Workflows

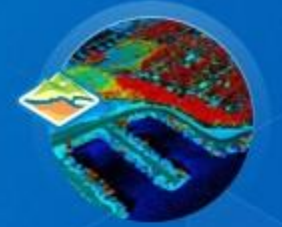
Driving Business with Smarter Decisions



State of Integrations Today



Imagery



Lidar



CAD



3D



Real-Time (IoT)



Tabular



Vector



Unstructured

Building Smarter Cities



Project Scenario

- **New Office Building**
- **Site Selection**
- **Existing Conditions**
- **Imagery**
- **Field Validation \ Tracking**
- **Design Changes**



Clipboard: Cut, Copy, Paste, Copy Path

Navigate: Explore, Bookmarks, Go To XY

Layer: Basemap, Add Data, Add Preset

Selection: Select, Select By Attributes, Select By Location

Inquiry: Infographics, Measure, Locate

Labeling: Pause, View Unplaced, More

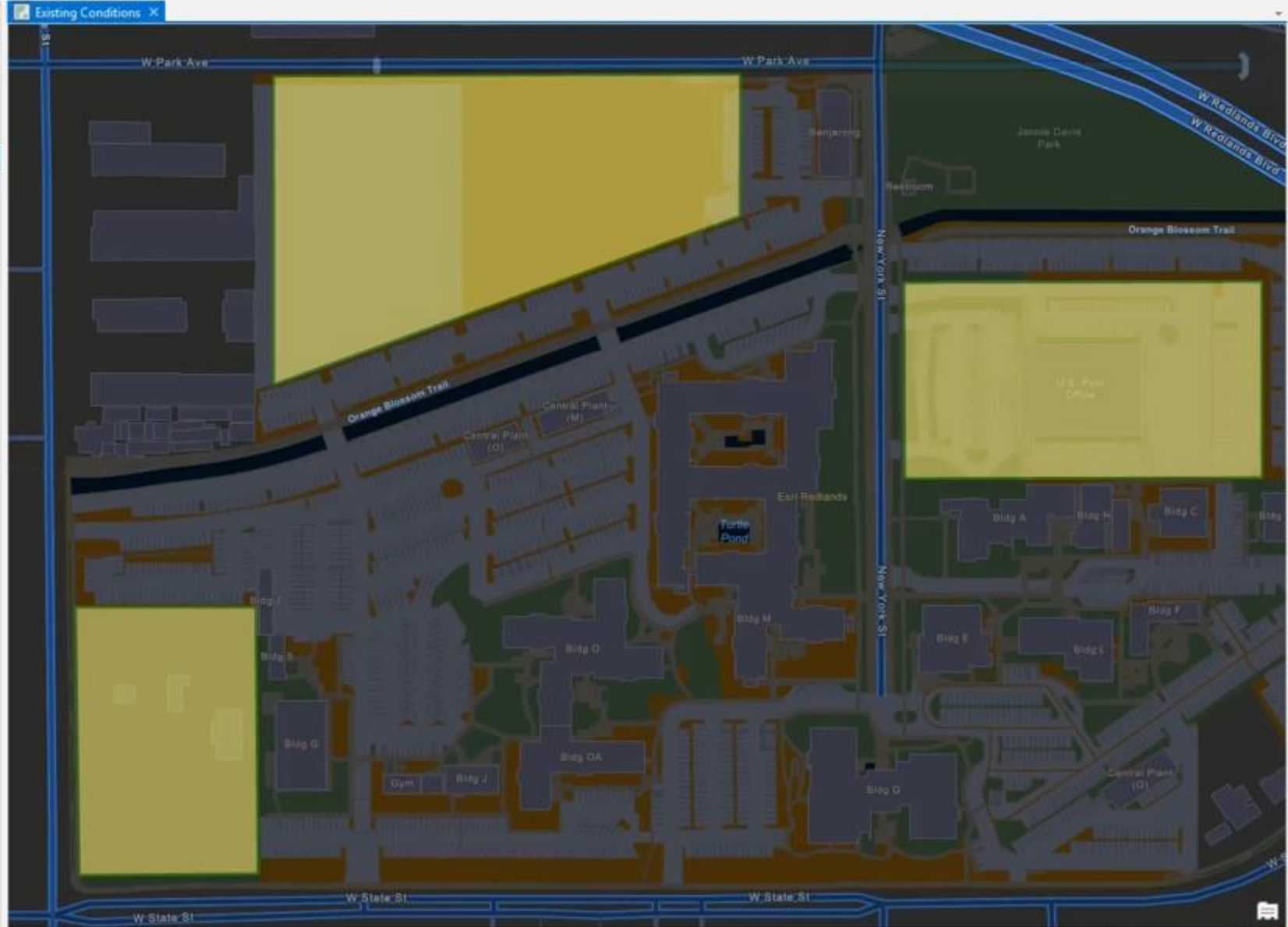
Offline: Convert To Annotation, Download Map, Sync, Remove

Contents

Search

Drawing Order

- Existing Conditions
 - Redlands Utilities
 - Proposed Buildings
 - Buildings2D
 - ProjectSite
 - USA Flood Hazard Areas
 - USA Soils Erodibility Factor
 - World Traffic Service
 - World Street Map (Night)

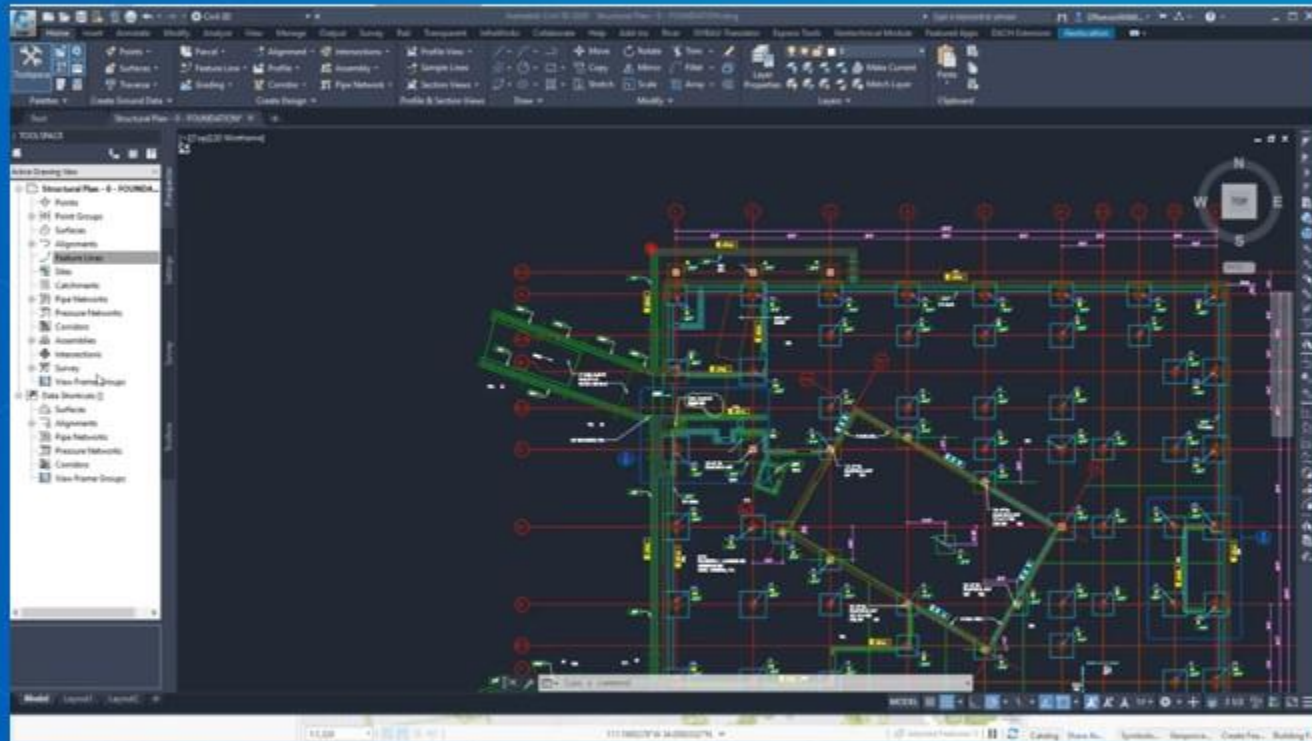


Catalog

Project Portal Favorites History

Search

- Maps
- Toolboxes
- Databases
 - Planning.gdb
 - Construction.gdb
 - PublishingGDB.gdb
- Styles
- Servers
 - server on aec-imagery.bd.esri.com.ags
 - Wayback Imagery Server.wmts
- Folders
 - EsriCampusRevitBldgE
 - CADfloors
 - DataPermission
 - Design Original
 - Design Revised
 - ImportLog
 - Index
 - RedExist_5bf79c
 - Construction.gdb
 - Planning.gdb
 - PublishingGDB.gdb
 - Redlands Campus Demo.gdb
 - Redlands Campus Demo.tbx
 - RedExist.lpkx
- Locators



DEMO:
GIS in Civil3D

Start Structural Plan - 0 - FOUNDATION*

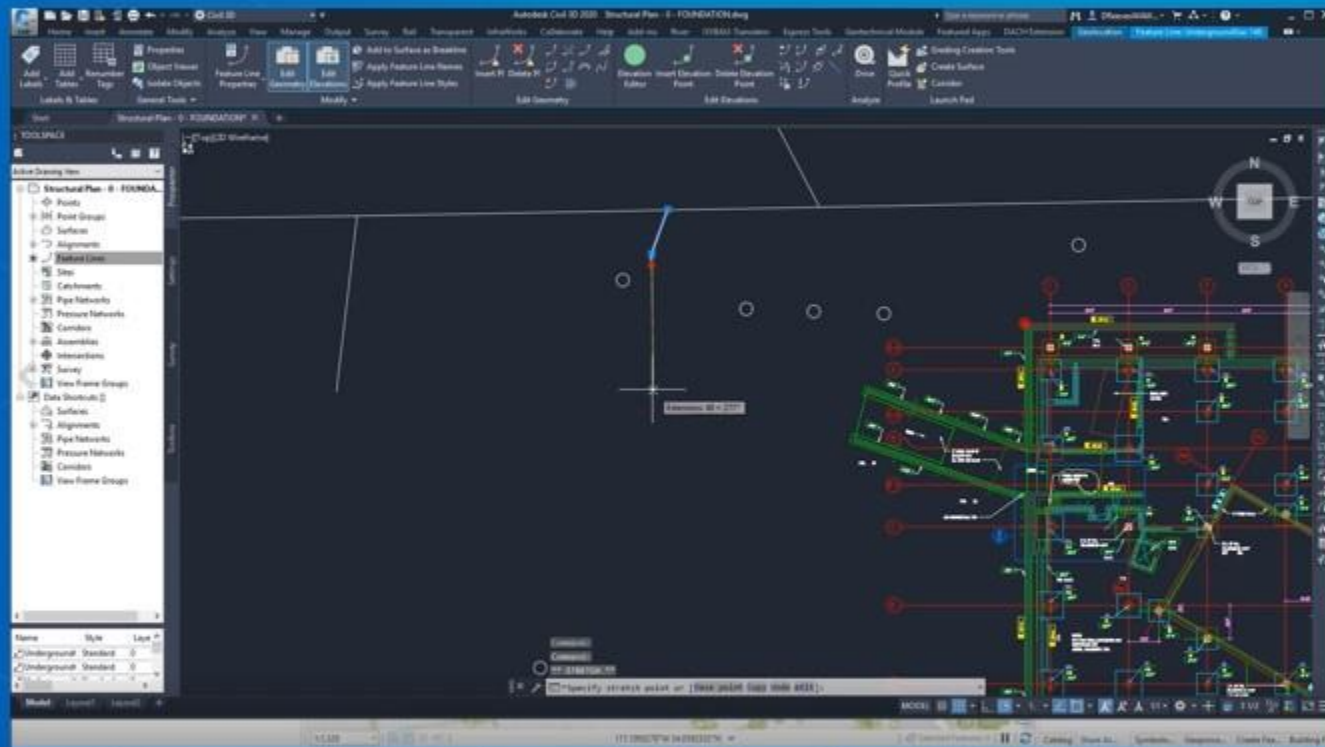
TOOLSPACE

Active Drawing View

- Structural Plan - 0 - FOUNDA...
- Points
- Point Groups
- Surfaces
- Alignments
- Feature Lines
- Sites
- Catchments
- Pipe Networks
- Pressure Networks
- Corridors
- Assemblies
- Intersections
- Survey
- View Frame Groups
- Data Shortcuts []
- Surfaces
- Alignments
- Pipe Networks
- Pressure Networks
- Corridors
- View Frame Groups

Prospector Settings Survey Toolbox





DEMO:
Editing GIS in Civil3D

Start Structural Plan - 0 - FOUNDATION* x

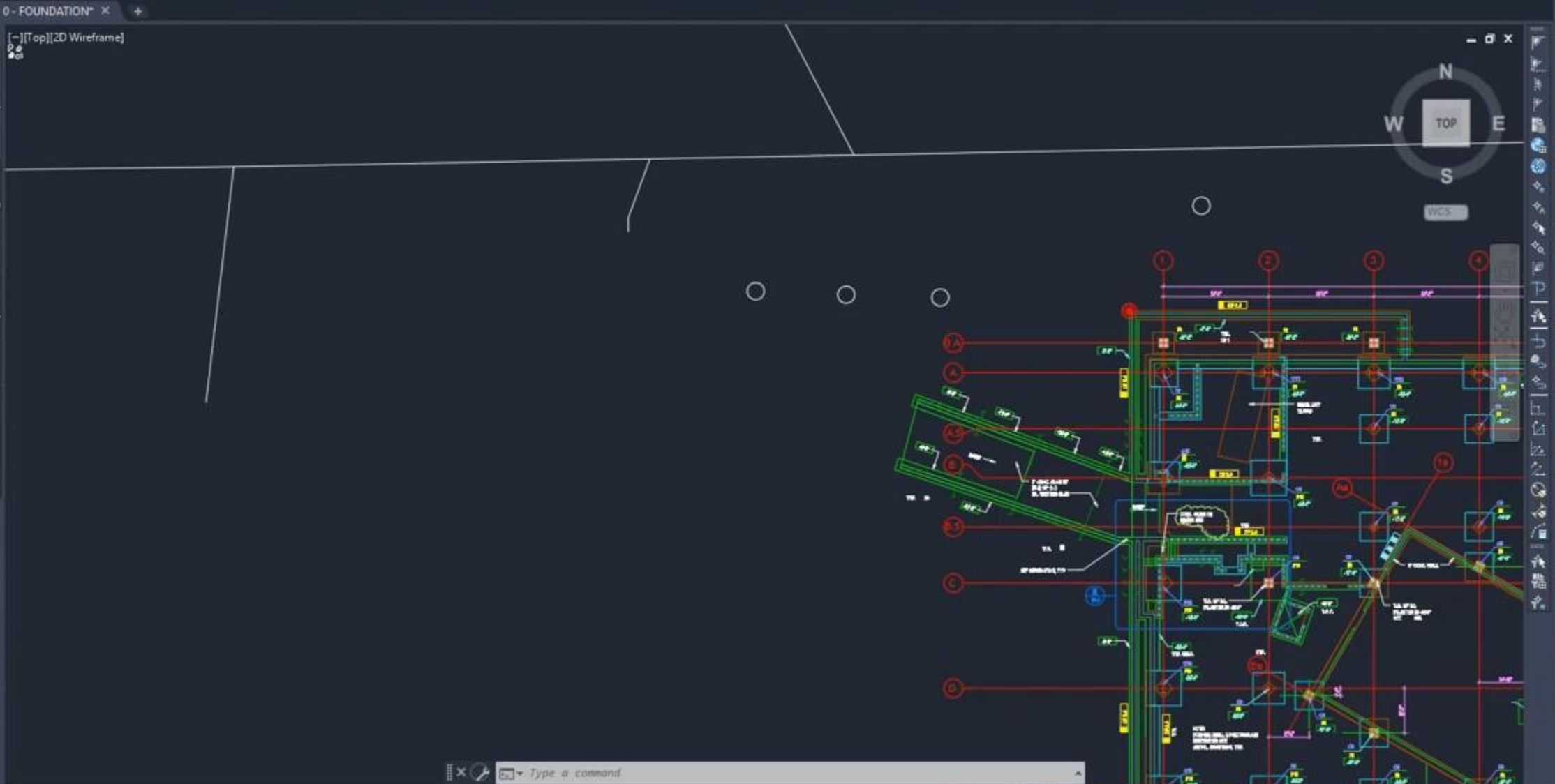
TOOLSPACE

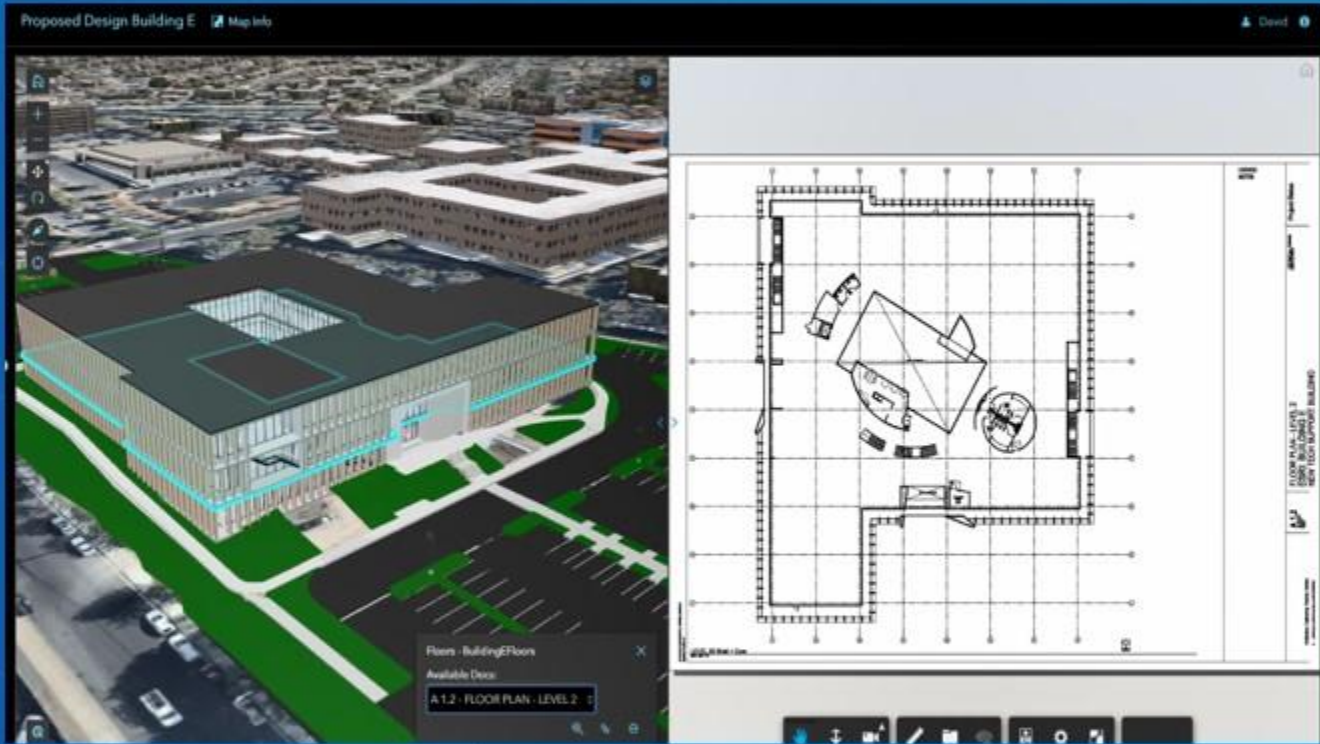
Active Drawing View

- Structural Plan - 0 - FOUNDA...
- Points
- Point Groups
- Surfaces
- Alignments
- Feature Lines**
- Sites
- Catchments
- Pipe Networks
- Pressure Networks
- Corridors
- Assemblies
- Intersections
- Survey
- View Frame Groups
- Data Shortcuts []
- Surfaces
- Alignments
- Pipe Networks
- Pressure Networks
- Corridors
- View Frame Groups

Name	Style	Laye
Underground1	Standard	0
Underground1	Standard	0

Model Layout1 Layout2 +





DEMO: GeoBIM Concept

Contents

Search

Drawing Order

- Building E Revit
 - 3D Layers
 - EsriCampusBuildings
 - ContextualBuildings
 - NewBuilding
 - New Lot
 - 2D Layers
 - World Imagery
 - Elevation Surfaces
 - Ground
 - WorldElevation3D/Terrain3D



Catalog

Project Portal Favorites History

Search

- Maps
 - Building E_2D
 - Building E Revit
 - Construction Map
 - Excon Options 3D
 - Existing Conditions
 - Revit original
 - Scene
 - Scene1
- Toolboxes
- Databases
- Styles
- Servers
- Folders
 - EsriCampusRevitBldgE
 - CADfloors
 - DataPermission
 - Design Original
 - SLPKs to Create a Webscene
 - Split Revit Model
 - Landscape
 - Unchanged
 - New Building.rvt
 - Architectural
 - Electrical
 - Mechanical
 - Piping
 - Structural
 - New Building.0001.rvt
 - New Lot.rvt
 - Design Revised
 - ImportLog
 - Index

Getting Help

Esri Services

Ready To Help You Successfully Leverage The ArcGIS Platform For Your Organization



Contact

Micah Callough

Technology Director for AEC

mcallough@esri.com

<https://www.linkedin.com/in/micah-callough/>

