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Update of Esri's Integration Work in 2020

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Learning Objectives

- What does Esri have to offer
- Gain understanding to make better decisions
- Have a chance to explore interoperability possibilities
- Share the recording with colleagues

Description

Autodesk has developed integrations with Esri through products like the Autodesk Connector for ArcGIS in InfraWorks software and Civil 3D software. Esri has likewise developed integration technology between various parts of the ArcGIS platform and Autodesk's products. Come see an update of Esri's work this year that includes significant enhancements to Esri's ArcGIS for AutoCAD, ArcGIS desktop support for AutoCAD Civil 3D, improved Revit file support, and a new connection to BIM 360 software. This overview will provide a perspective of Esri's work to improve interoperability between geographic information system (GIS) and design workflows delivering on the promise of the strategic partnership between these two companies.

Speakers

Don Kuehne, Esri Sr. Product Engineer

Don is a frequent conference speaker and has 32 years of experience in CAD/Civil/GIS/BIM software, including 28 years at Esri, where he is currently a Sr. Product Engineer helping to design, communicate and build software products for those working in Civil, BIM and GIS.

Karen Hodge, Esri Principal Senior Software Developer

As a Principal Senior Software Developer at Esri for over 25 years, Karen is the primary software architect for integrating CAD and BIM with GIS solutions. She currently leads the development teams focused on BIM, Civil, and CAD interoperability.

What does Esri have to offer in terms of Autodesk/Esri integration

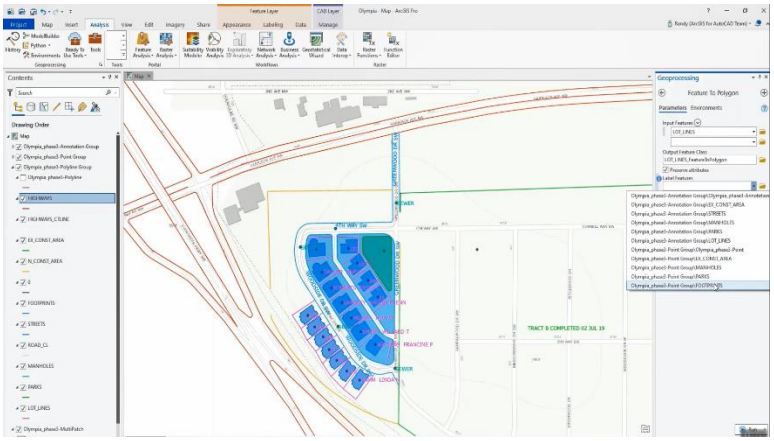
Esri and Autodesk have entered an exciting partnership to improve interoperability between Autodesk design applications, and the Esri GIS platform. From Autodesk you have seen the release of the Connectors for ArcGIS in Infraworks and a similar capability in AutoCAD Civil 3D. These technologies were designed and built by Autodesk and I encourage you to explore more about these technologies in other sessions here at virtual AU 2020. What we are going to be sharing here is the answer to the question, *"What has Esri done to improve Autodesk and Esri interoperability in the areas of CAD, Civil Design and BIM."*

Support for Autodesk Design files in Esri's desktop GIS software, ArcGIS Pro

Esri's ArcGIS Pro is the primary desktop software application used by the GIS Professional. ArcGIS Pro is used by GIS folks as a platform for data creation, editing analysis, map making, data maintenance and sharing. Autodesk work-products in the form of models and drawings often provide the data used fuel these GIS endeavors. Esri has been working on improving the ability to make the most of your Autodesk data and BIM design workflows.

Reading and Writing AutoCAD DWG files

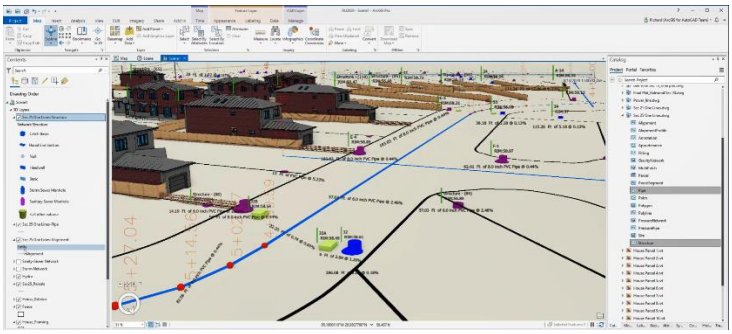
ArcGIS Pro reads AutoCAD DWG/DXF files version 12 – 2021 as-is as useful map information and as a source of new GIS features. ArcGIS Pro can also export or append GIS feature information to AutoCAD DWG/DXF files. When feature data is written to an AutoCAD file that content is expressed as simple AutoCAD entities that all versions of AutoCAD can read, but also includes additional information in the form of an Esri coordinate system definition and fully attributed GIS data that comes alive when Esri's ArcGIS for AutoCAD plug-in software is used with AutoCAD. ArcGIS Pro also reads the GIS information generated in simple AutoCAD drawings by Esri's ArcGIS for AutoCAD plug-in software.



ArcGIS Pro Reads/Writes AutoCAD design files.

Reading Autodesk Civil 3D design elements

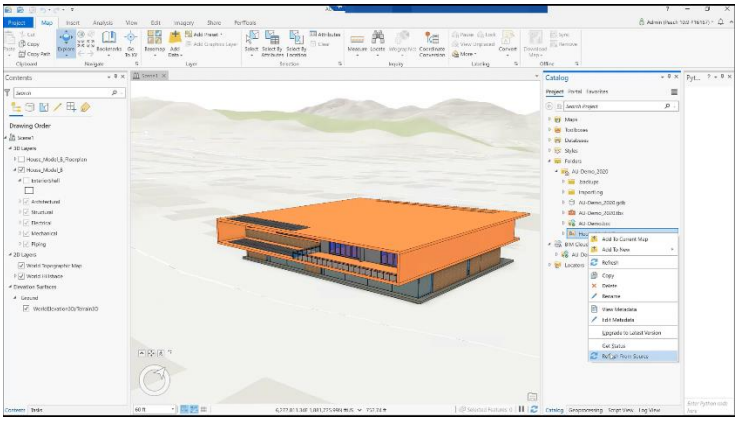
In addition to the simple entities of AutoCAD and the enhanced GIS information created by the ArcGIS for AutoCAD plug-in, ArcGIS Pro reads Civil 3D design elements and their included design paramters as feature attributes. ArcGIS Pro also uses the design metadata of these Civil 3D entities to create enhanced symbolic representations of the Civil 3D features to include things like the stationing of alignments and the 3D visual representation of pipe networks and their fittings. These design parameters are made available to the tools of ArcGIS Pro as feature attributes which makes this information a useful source of data for GIS asset management applications for managing utility networks or parcel management.



Civil 3D entities are useful to fuel ArcGIS asset applications.

Reading Autodesk Revit files

ArcGIS Pro directly reads Autodesk Revit design file version 2016-2021. It reads the Revit .RVT file and organizes the information by category making it available as content in 2D an 3D maps. This information is useful as a source of content for indoor mapping applications as well as for understanding complex 3D design projects in their geospatial context.



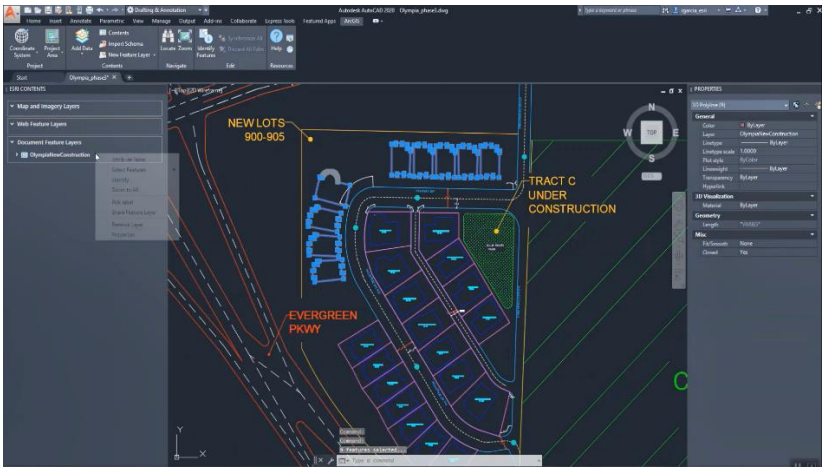
Refresh Revit Content in ArcGIS Pro Stored in BIM 360.

Esri's ArcGIS for AutoCAD Provides AutoCAD Users with access to Web GIS

ArcGIS for AutoCAD is Esr's plug-in software application to Autodesk's AutoCAD software. It provides AutoCAD users the ability to create and edit GIS data withih a standard AutoCAD file. It creates and reads GIS information understood by Esri's ArcGIS Pro desktop software, and is also a client software to the web services of Esri's ArcGIS Online and ArcGIS Enterprise.

Reading and Writing GIS data within DWG files

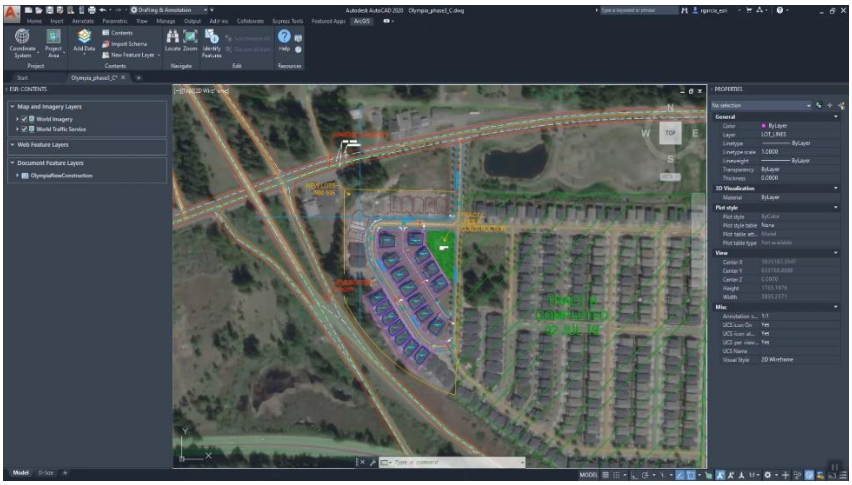
When ArcGIS Pro exports data to a DWG file you can view the geometry in standard AutoCAD as simple AutoCAD entities. If however you choose to download and install ArcGIS for AutoCAD, the free plug-in to AutoCAD from Esri, you will see that more than just the geometry you have a complete attributed GIS dataset within that same DWG file for you to use. Likewise you can organize and create GIS feature data using standard AutoCAD entities using your existing CAD standards and workflows.



Use ArcGIS for AutoCAD to Access GIS Data in DWG format Exported from ArcGIS Pro

Access Maps and Feature Data Shared on ArcGIS Online or ArcGIS Enterprise

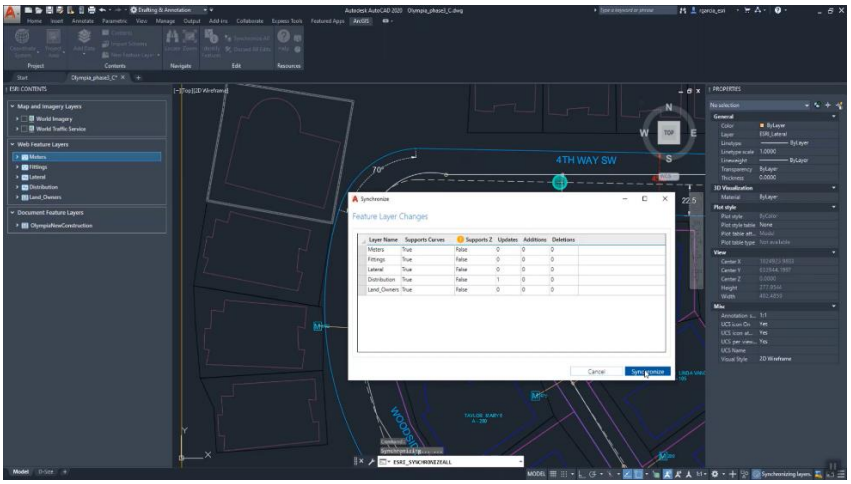
With its understanding of geopostioning you can use ArcGIS for AutoCAD to access maps and data shared on ArcGIS online, including the useful content curated by Esri and GIS users across the globe through free or subscription access to ArcGIS Online. You can also access your own orgnaization's GIS information managed in a ArcGIS Enterprise implementaiton.



ArcGIS Online Maps in ArcGIS for AutoCAD (*Esri World Imagery* and *Live Traffic*).

Edit GIS Data Through Multiuser Web Services and Collaborate with GIS Users

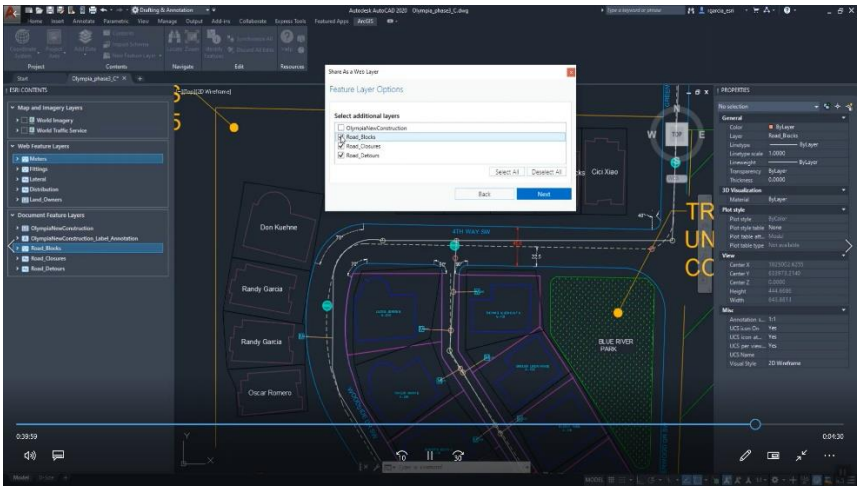
ArcGIS for AutoCAD extends the editing capabilities of AutoCAD to edit not only GIS information stored within the DWG file, but also allows you to edit GIS data through web feature services managed by ArcGIS Online and ArcGIS Enterprise, allowing AutoCAD to be another software editing client of the ArcGIS platorm. AutoCAD users, field crews using ArcGIS Collector for mobile data collection, and GIS professionals using ArcGIS Pro can all be seeing, verifying, collecting and editing the same data at the same time.



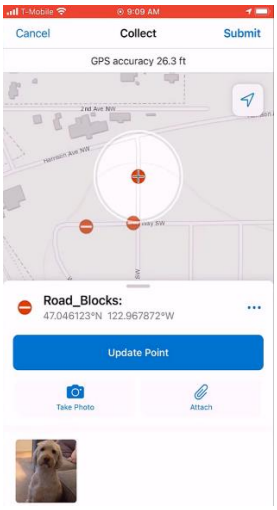
Edit ArcGIS web services using ArcGIS for AutoCAD.

Create ArcGIS Web Services from Drawing Content for Field Collaboration

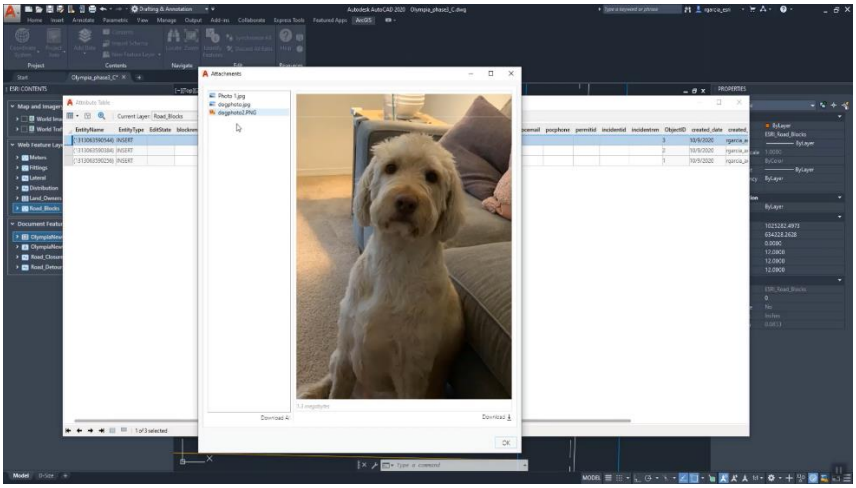
The latest version of ArcGIS for AutoCAD adds the capability to share GIS data created using AutoCAD with other ArcGIS collaborators by sharing through ArcGIS Online or ArcGIS Enterprise.



Create ArcGIS Web Services from AutoCAD.



ArcGIS field apps can use web feature layers created in ArcGIS for AutoCAD.



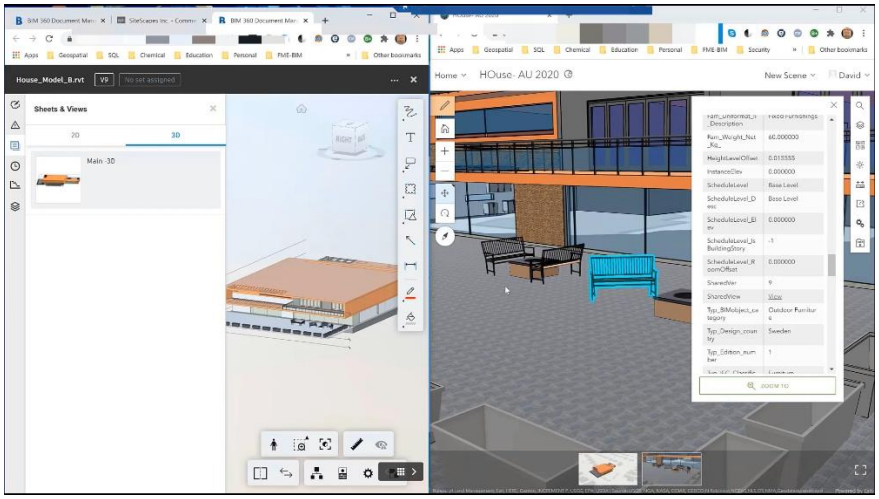
Accessing ArcGIS Collector data within ArcGIS for AutoCAD.

Sharing Autodesk content in the ArcGIS Platform

The design information from Autodesk products is often the source of new infrastructure data that fuels the asset mangment appliations of GIS. The ability to use that content to build and update the GIS record is a common goal of better Autodesk and Esri interoperability. The ability to share design content as a source of information itself is also a powerful tool you can use to see project work in its geographic context throughout the infrastructure lifesycle. All of the AutoCAD, Civil 3D and Revit content that is readable by ArcGIS Pro is also shareable to throughout the ArcGIS Platform to help stakeholders view that content withing its geographic context. This helps people, non-engineering and non-GIS people visualize this content in simple to understand web or mobile experiences as well as within their design tools like AutoCAD, AutoCAD Civil 3D or Infraworks.

ArcGIS Pro reads design file content stored in Autodesk BIM 360

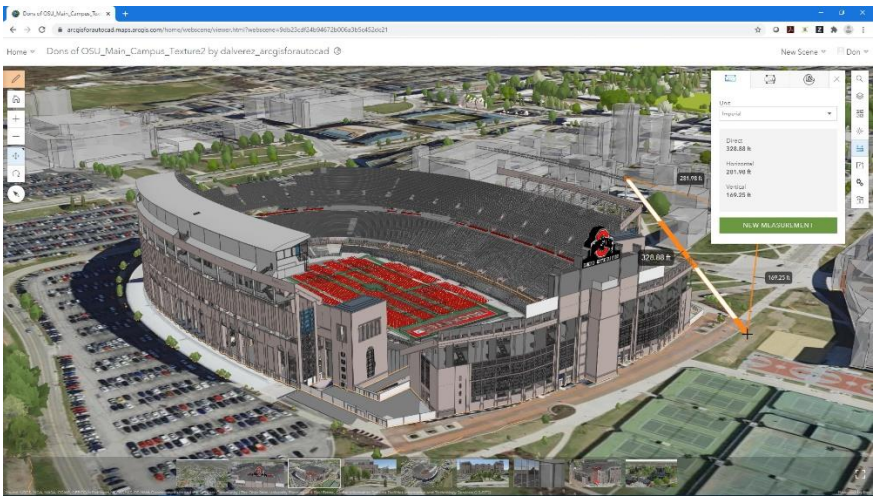
Interoperability is not just about reading and writing Autodesk design file content in ArcGIS its also about improving workflows and data managment. This year ArcGIS Pro includes the ability to access AutoCAD, Civil 3D, and Revit models stored in Autodesk BIM 360. ArcGIS Pro also has the ability to detect updates to files and refresh them within a map. Information then shared as web services also maintains a link to BIM 360 and that link can be used to cross reference that content using Autodesk viewing technology like the BIM 360 Forge viewer.



BIM 360 sourced information retains its links shown here in BIM and GIS viewers.

ArcGIS Pro shares AutoCAD, Civil 3D and Revit models as 3D web services

The ArcGIS Platform has the means to share its GIS content from many different sources. This includes sharing CAD and BIM sourced content as maps, scenes and feature services to be consumed in many different GIS computing environments, and software appilations. These include web, mobile and desktop GIS applications and rich API's, that allow third parties to build custom applications in these same computing environments.



Data Courtesey of *OHIO STATE UNIVERSITY INFORMATION TECHNOLOGY SERVICES*.

Other Resources

To learn more about Esri and Autodesk interoperability at AU2020 visit : https://go.esri.com/AU2020