AUTODESK. UNIVERSITY

Fusing Document Management and GIS: An Autodesk Approach

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About the speaker

Gerry James

Want to integrate document management frameworks with your GIS? Meet Gerry James a very experienced GIS and data management specialist whos career has focused on CAD/GIS integration over the past 25 years.

Fusing Document Management with your GIS

So what if your team needs access to your CAD/BIM models in the field, or anywhere.

- **What information does your team need?**
  - Design data?
  - Property data?
  - As-built models?
  - Infrastructure data?
  - And so on…
- **How do we provide access to the documents, models and/or data in the field?**
- **What software are your teams currently using?**
- **What software/services can your teams leverage to provide easy access to required information?**
- **How can we leverage the power of core document management platforms within a GIS environment?**

What is Document Management

VAULT

Autodesk Vault provides organizations with a hosted platform for storing and searching for documents, implementing workflows through built-in and API integration, and providing custom security for both CAD and non-CAD documents.

BIM 360

BIM 360 allows for a cloud based approach that provides storage and access of many different document types, primarily BIM and CAD models. Over the past few years, Autodesk has added extensive capabilities to this product that allows for better integration with software such as Civil 3D and Revit.

FORGE

Forge is the secret sauce for integrating 3rd party applications into the BIM 360 platform. This cloud based service provides an API interface that allows developers to build custom applications that leverage BIM 360 allowing for fluid exchange of data between a variety of platforms.

What is Vault

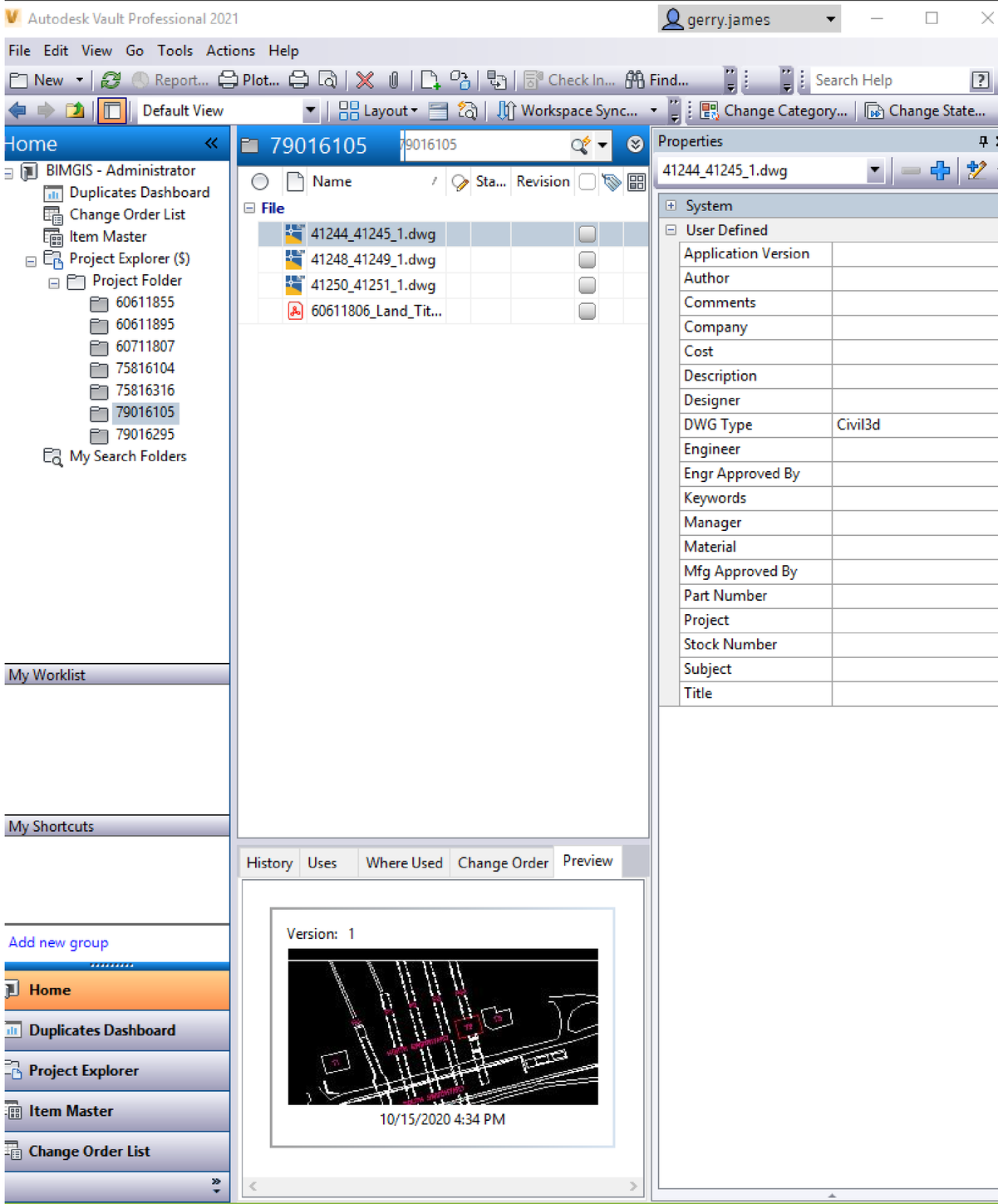
Server based Document management system

Developed by Autodesk

Provides document and workflow management

Provides extended scenario based security

Well integrated with CAD design files



What is BIM 360 Docs

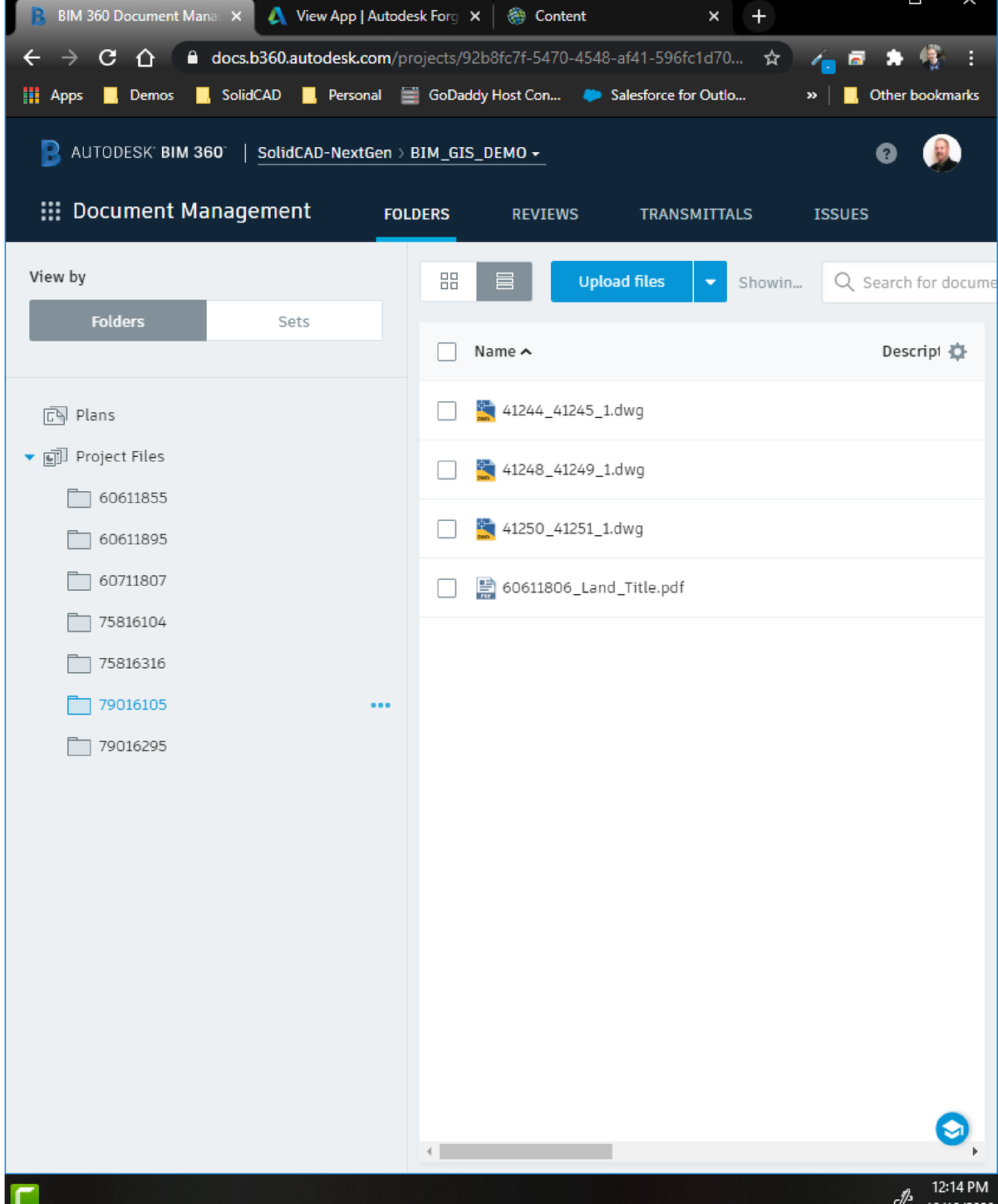
Cloud based document and model management system

Developed by Autodesk

Provides model, project and workflow management

Provides extended scenario based security

Well integrated with CAD design files including BIM models



So what is GIS

ESRI says “A geographic information system (GIS) is a framework for gathering, managing, and analyzing data.”

The reality is GIS provides a mechanism for communicating critical project information with a geographic context.

GIS provides a solid understanding of WHAT – WHERE – WHEN and allows for analysis that provides the HOW & WHY

GIS Options

DESKTOP

ArcGIS Desktop and Pro

- Robust desktop platforms for creating, publishing and analyzing data

Autodesk Map 3D and Civil 3D

- Robust desktop platforms for viewing, analysing and integrating GIS and CAD data

MOBILE

Survey 123

- Forms based application that provides a platform for creating field data collection programs

ArcGIS Collector

- Mobile platform that connects field teams to corporate GIS data sources

WEB

ArcGIS for Server

- Self hosted server based software for creating and publishing data, maps and applications

ArcGIS Portal

- Plug in to ArcGIS Server to allow for easier hosting and management of data and applications

So why do we integrate DM and GIS

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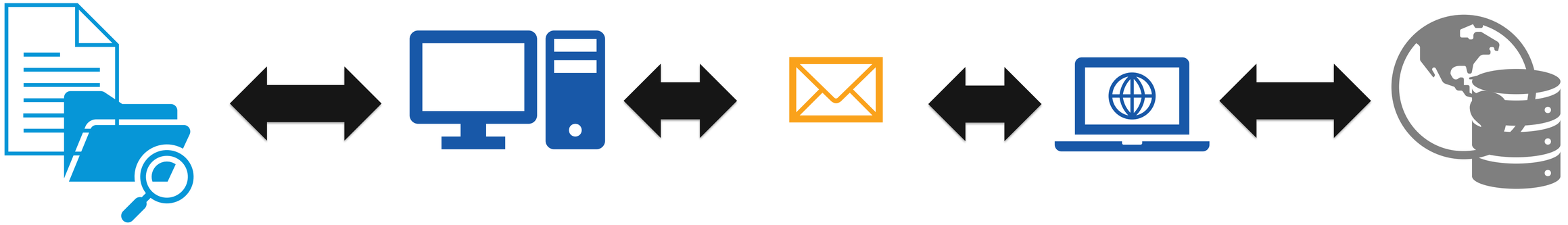
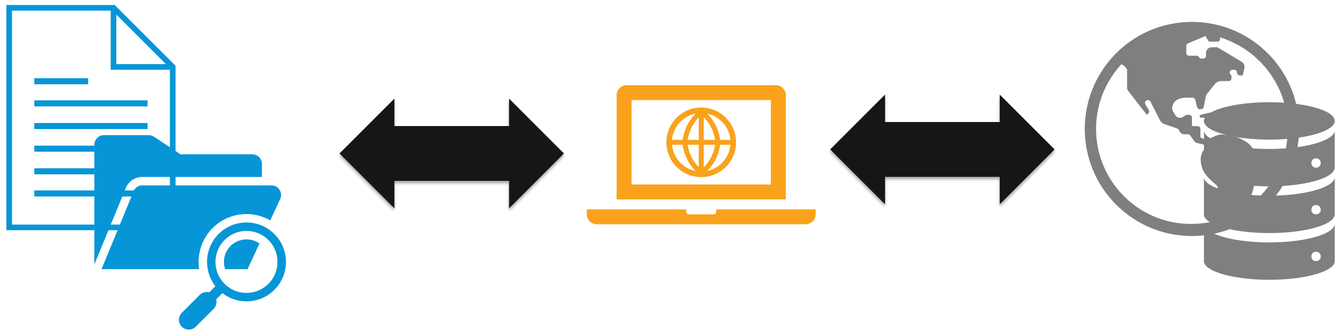
So why do we integrate DM and GIS

THIS



BECOMES



Both Document Management and GIS strive to create a ‘Sole Source of Truth’

“It is a capital mistake to theorize before one has data.”

Sherlock Holmes (Arthur Conan Doyle)

Now how do we integrate DM and GIS

A STORY:

Imagine a development project involving a new technical school in Vancouver;

Now imagine you're an engineer that must go into the field for an inspection;

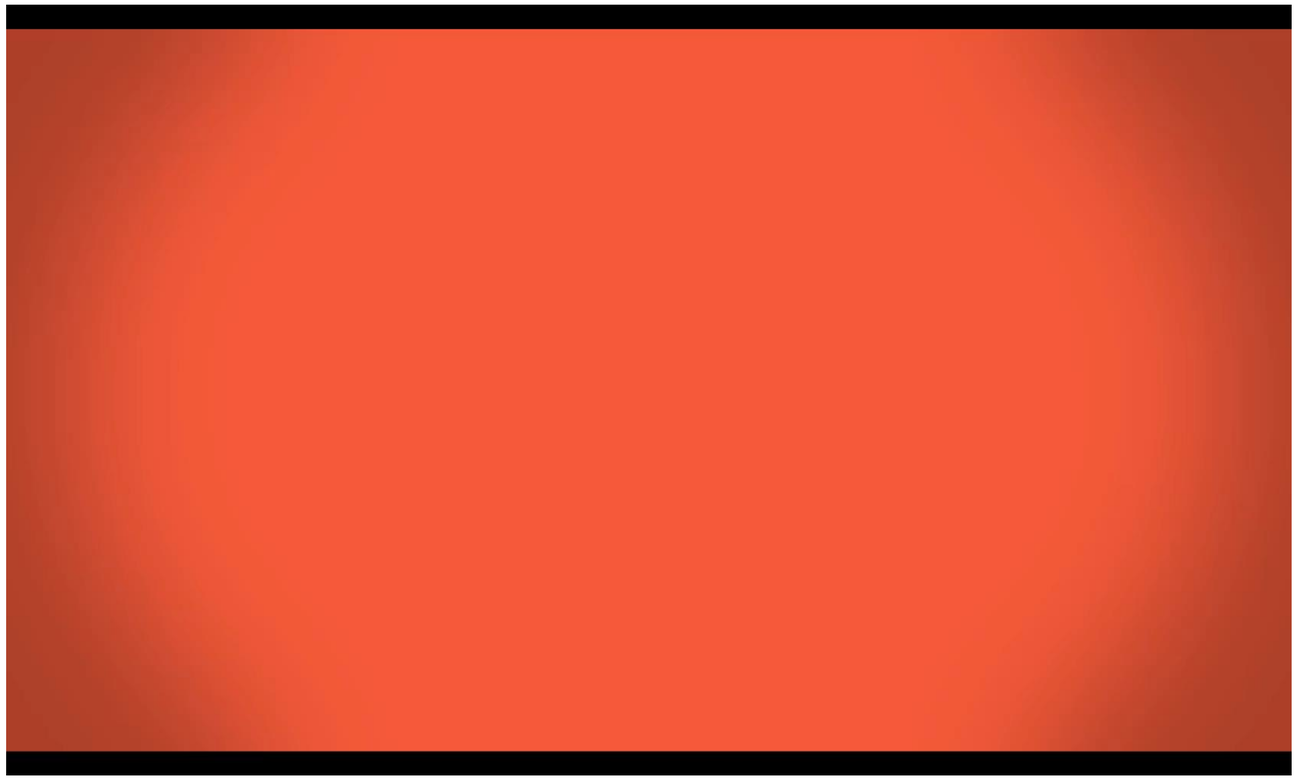
You need access to some of the design models for the building in context with current conditions;

What are your options?

-- DEMO --

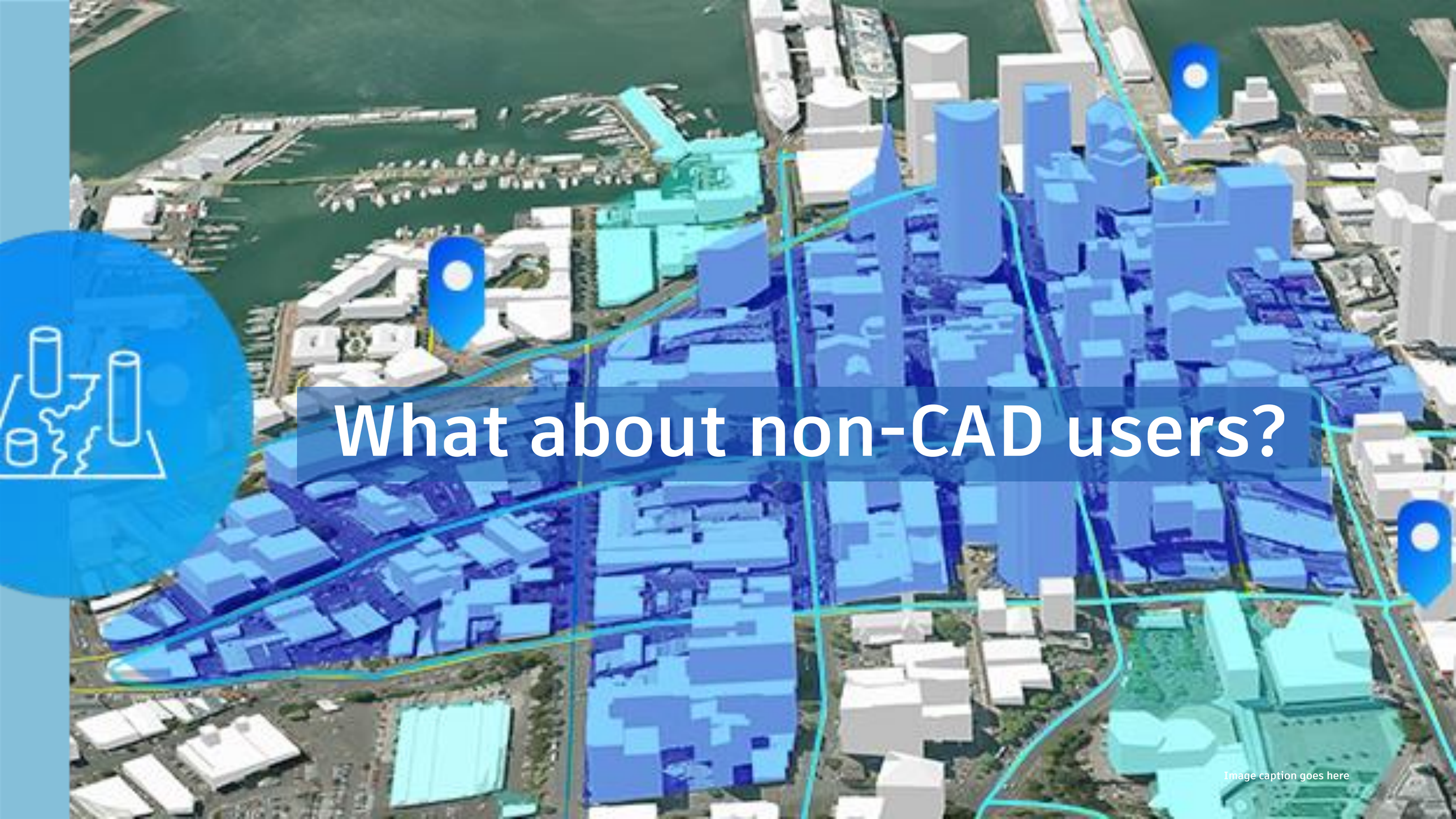
Autodesk Integration

Autodesk DM Integration Video (Click to View)



How do we fuse document management functionality with GIS data in Civil 3D

What about non-CAD users?



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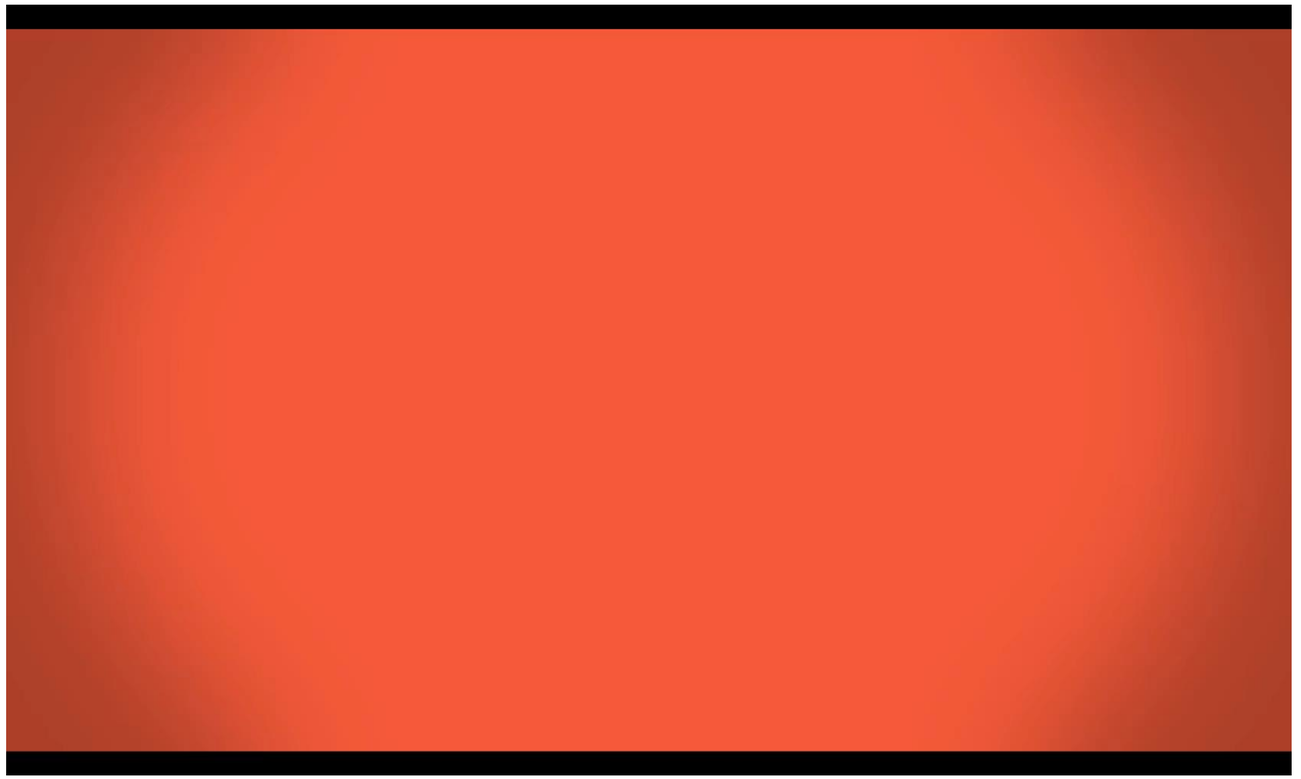
Consider This

- A building inspector goes into the field to check on a change order for layout.
- The building inspector doesn’t have Civil 3D, or any CAD software for that matter.
- She still needs to see certain documents associated with the project
- What will we do?....

ESRI Integration

ESRI DM Integration Video (Click to View)



How do we access building information without Autodesk products?

Before You Start Programming

BIM 360 DOCS

- **Create a BIM 360 account if one doesn’t exist**
- **Add a project to the appropriate hub**
- **Make sure to share with appropriate project members**

FORGE

- **Create a Forge account if one doesn’t exist**
- **Activate your subscription**
- **Create a Forge APP that links to the correct BIM 360 project**

Other Programming Considerations

VISUAL STUDIO PROJECT

- **ASP.NET Core Web Application seems to work best**
- **Make sure to add the NewtonSoft JSON and Autodesk Forge NuGET packages**
- **Use appsettings.json to store project parameters (e.g. Client ID)**

```
{
  "Logging": {
    "LogLevel": {
      "Default": "Information",
      "Microsoft": "Warning",
      "Microsoft.Hosting.Lifetime": "Information"
    }
  },
  "AllowedHosts": "*",
  "FORGE_CALLBACK_URL": "http://bimgis.localhost/bimviewer1/api/forge/callback/oauth",
  "FORGE_CLIENT_SECRET": "0KAZ7r5Vkj9eqCB4",
  "FORGE_CLIENT_ID": "SaVNulMKQrCEb4nk4CvC5zcjFQp1mPWg",
```

Other Programming Considerations

CUSTOM ENVIRONMENT VARIABLE CALL

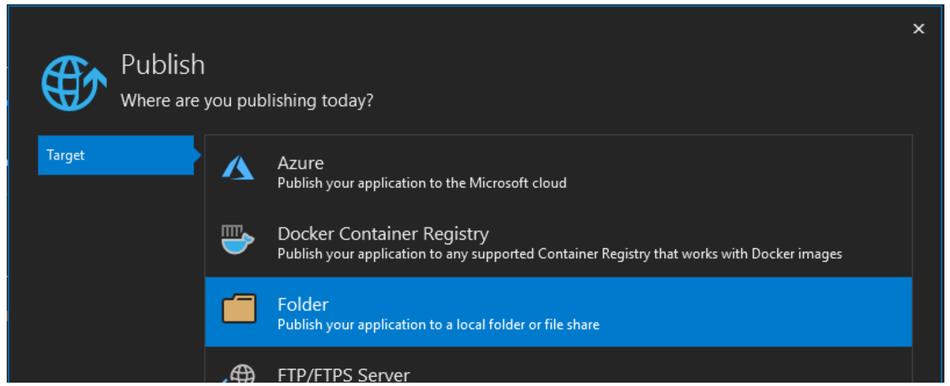
- Replace this…

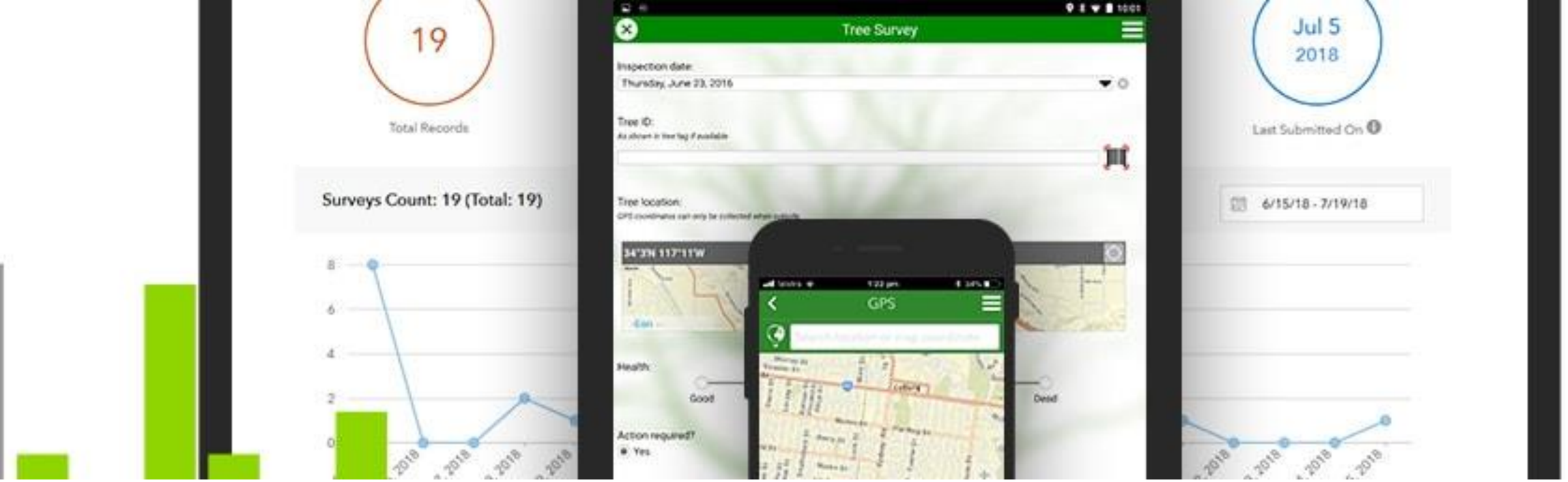
```
/// <summary>
/// Reads appsettings from web.config
/// </summary>
12 references
public static string GetAppSetting(string settingKey)
{
    string value = "";
    using (StreamReader file = new StreamReader("appsettings.json"))
    using (JsonTextReader reader = new JsonTextReader(file))
    {
        Newtonsoft.Json.Linq.JObject o2 = (Newtonsoft.Json.Linq.JObject)Newtonsoft.Json.Linq.JToken.ReadFrom(reader);
        value = o2.GetValue(settingKey).ToString();
    }
    return value;
}
```

Other Programming Considerations

WORKING WITH CONTROLLERS

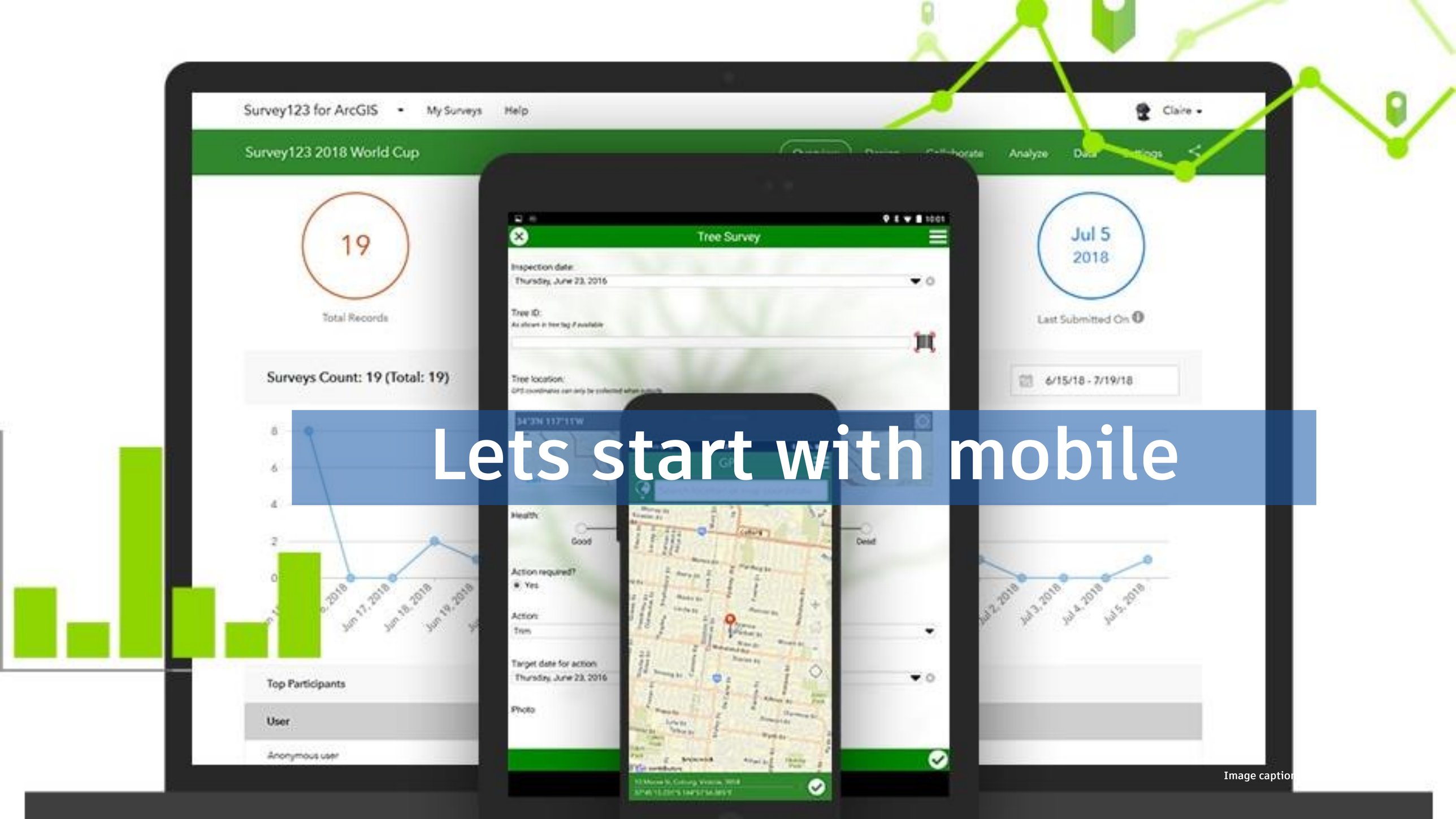
- **Ensure routing is set correctly for all HttpGet statements**
- **If using IIS, set up site as a distinct Web Site not an application under an existing site**
- **Ensure bindings are set with a third level domain so that IIS knows which site to call**
- **If your using IIS, publish the site as a Folder. If you have done all the settings above the site should “just work”.**





Other Ways to Collaborate

- Integrating document management using mobile devices
- Integrating BIM models from Revit into other viewer utilities

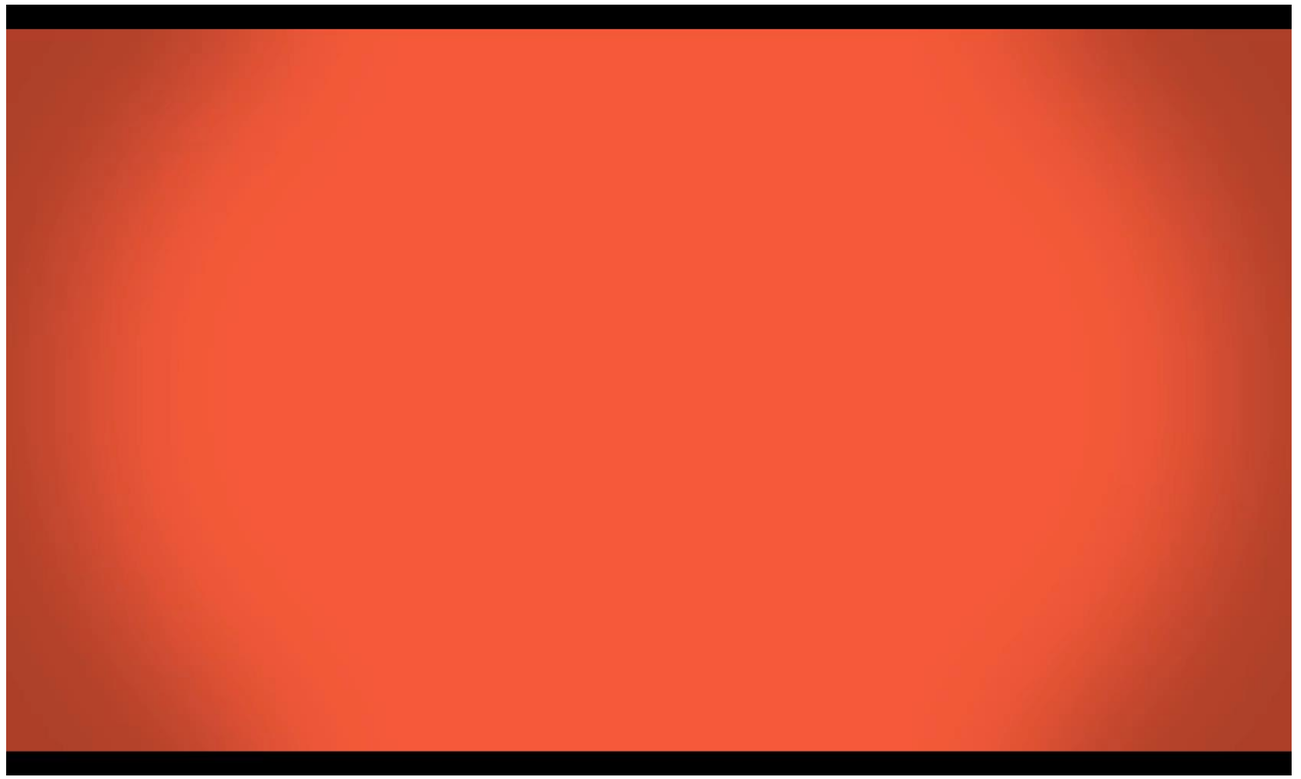


Lets start with mobile

Image caption

Mobile Integration

Mobile DM Integration Video (Click to View)



How do we access building information without Autodesk products?

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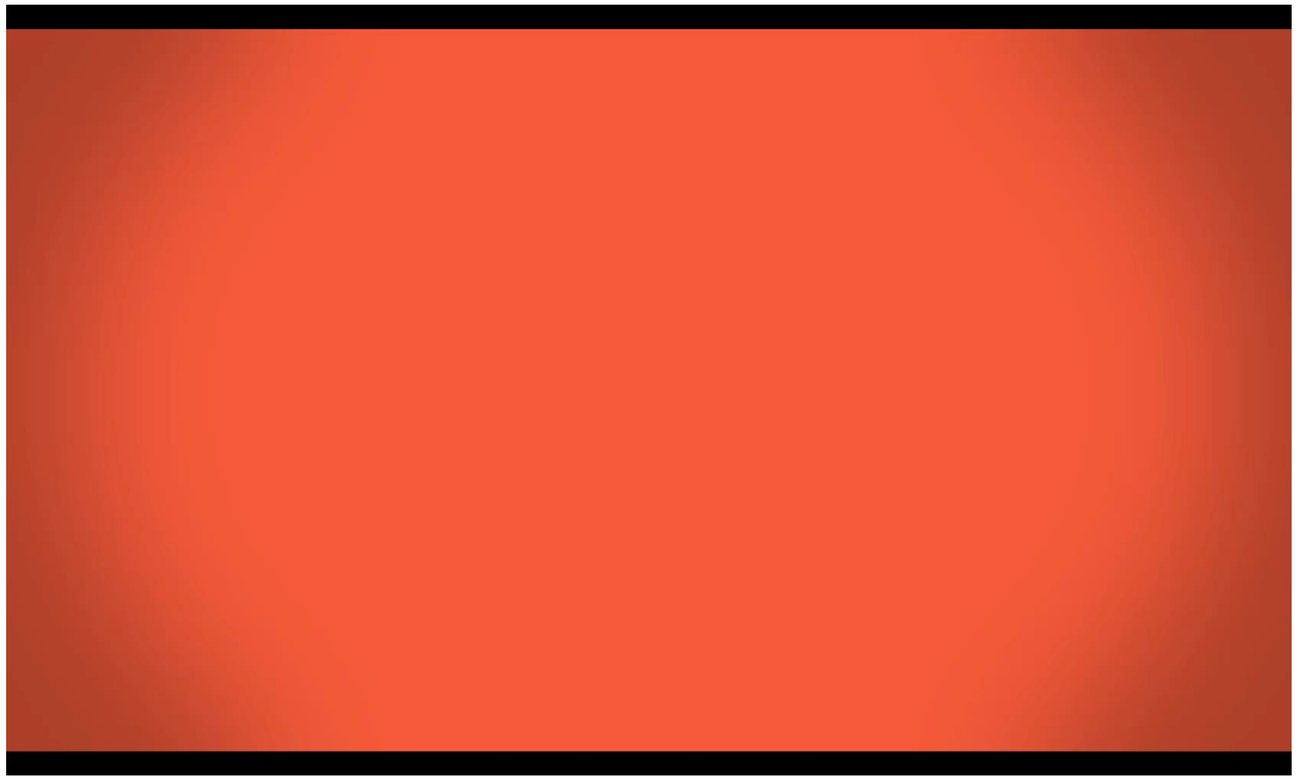
BIM Models in ArcGIS Online

BIM Model Integration Video (Click to View)



How do we building models in context with GIS data?

FINIS