# Tips & Tricks - 10 Ways to Increase Your Productivity with Autodesk InfraWorks 360

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# Class summary

Don’t we all want to get the most out of Autodesk InfraWorks 360 with a goal of minimizing effort and time, cutting down overall project costs and going beyond what we ever imagined doing? This session will show you 10 ways you can realize this.

From powerful advanced techniques for creating, editing and analyzing models to advanced tips for rendering and visualization, creating custom schemas, representing transportation features like intersections, bridges and overpasses or creating custom scripts that create new or enhance existing capabilities of InfraWorks 360, this is a must attend course for anyone wanting to take Autodesk InfraWorks 360 to the next level.

# Key learning objectives

At the end of this class, you will be able to:

- Lean advanced techniques to import and visualize various types of data in InfraWorks 360
- Represent complex site and transportation features such as building pads, road furniture or intersections
- Move data between Autodesk InfraWorks 360 and other Autodesk design tools
- Create compelling content or visuals to communicate design intent

# Extending the InfraWorks 360 Database Schema

**Database Schema**: Describes the entire configuration of the InfraWorks 360 database, including all of its tables, relations, and user definable attributes

- The Autodesk InfraWorks 360 schema definition per default is incorporated in the model itself.
- Standard available InfraWorks 360 “base” classes from which new classes can be created are:

**BARRIERS**
**BUILDINGS**
**CITY_FURNITURE**
**COVERAGES**
**LAND_AREAS**
**PIPELINES**
**PIPE_CONNECTORS**
**POIS**
**RAILWAYS**
**ROADS**
**TREES**
**WATER_AREAS**

**Step 1:** Create 2 new classes ***CITY_BUILDINGS*** and ***CITY_ROADS*** from **BUILDINGS** and **ROADS** base classes

```
"Classes": [
        {
             "name": "CITY_BUILDINGS",
             "base": "BUILDINGS",
             "Attributes": []
        },
        {
             "name": "CITY_ROADS",
             "base": "ROADS",
             "Attributes": []
        }
```

No comma →

**Step 2:** Create 4 attributes for the new ***CITY_BUILDINGS*** class called **BUILDING_TYPE**, **YEAR_BUILT**, **FLOOR_AREA** and **ANNUAL_ENERGY_USE**, in the ***Class Attributes*** section

```
{
  "name": "BUILDING_TYPE",
  "type": "String"
},
{
  "name": "YEAR_BUILT",
  "type": "Integer"
},
{
  "name": "FLOOR_AREA",
  "type": "Double"
},
{
  "name": "ANNUAL_ENERGY_USE",
  "type": "Double"
}
```

No comma →

**Step 3:** Create 2 attributes for the new **CITY_ROADS** class called **ROAD_TYPE** and **CONDITION_INDEX** in the ***Class Attributes*** section

```
{
 "name": "ROAD_TYPE",
 "type": "String"
},
{
 "name": "CONDITION_INDEX",
 "type": "Integer"
}
```

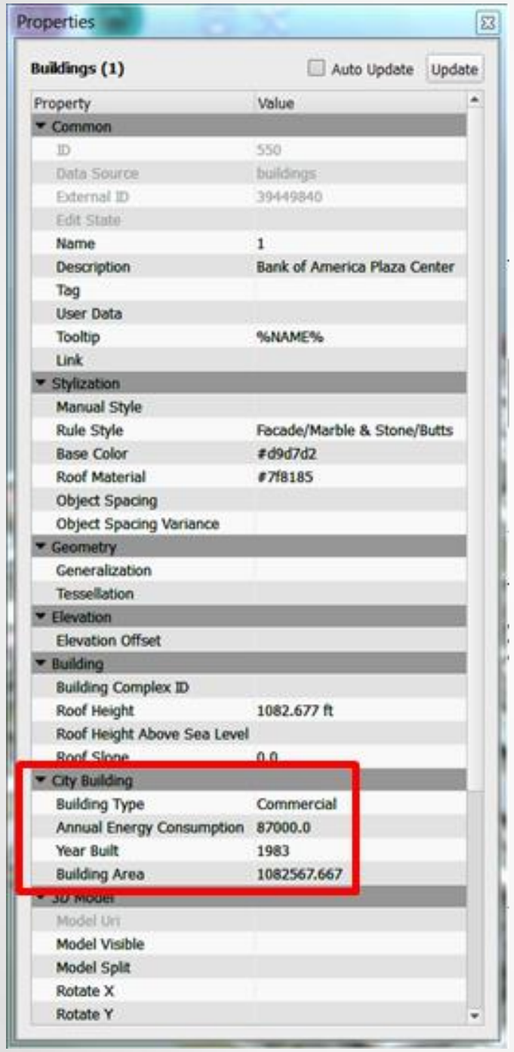
**Step 4:** Define the style, naming and order of the attributes in the "Display" section

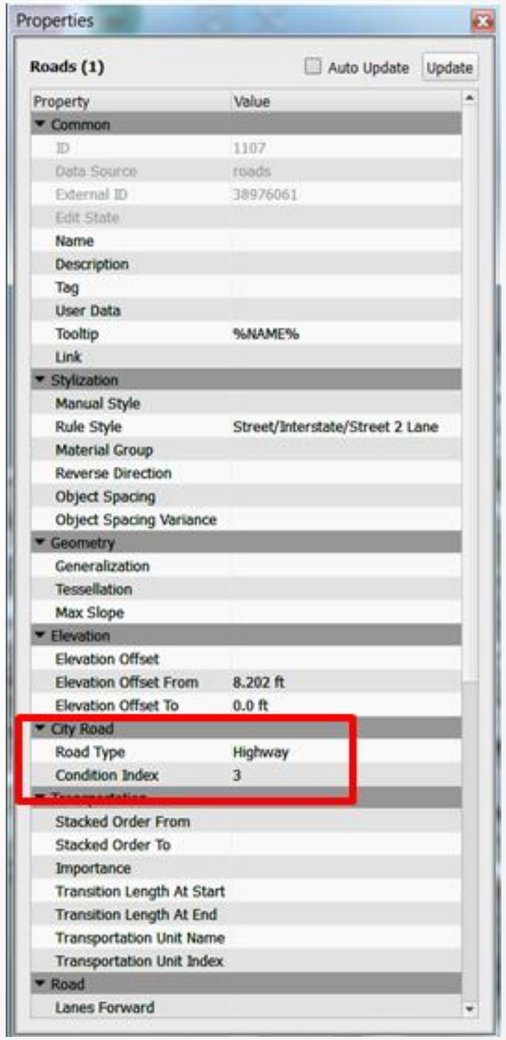
```
"Display": {
      "en": [
                {
                "name": "BUILDING_TYPE",
                 "displayName": "Building Type",
                 "category": "City Building",
                 "priority": 500
                },
                {
                "name": "YEAR_BUILT",
                 "displayName": "Year Built",
                 "category": "City Building",
                 "priority": 501
                },

                {
                 "name": "FLOOR_AREA",
                 "displayName": "Gross Floor Area",
                 "category": "City Building",
                 "priority": 502
                },
                {
                 "name": "ANNUAL_ENERGY_USE",
                 "displayName": "Annual Energy Consumption (kWh)",
                 "category": "City Building",
                 "priority": 503
                },
```

```
    {
     "name": "ROAD_TYPE",
     "displayName": "Road Type",
     "category": "City Road",
     "priority": 506
    },
    {
     "name": "CONDITION_INDEX",
     "displayName": "Condition Index",
     "category": "City Road",
     "priority": 507
    }
 ]
```

**Step 5**: Save the file as ***im_schema.json*** and place in the ***<model.files>/unver*** directory

**Step 6:** Close and restart the InfraWorks 360 project for the schema changes to take effect.



# Scripting to Import Custom Data

**Why Script:**

- Simplify workflows
- Automate workflows
- Extend the existing capabilities of InfraWorks 360
- Integrate *with* other applications using external Application Programming Interfaces (*APIs)*.

**Scripting Language:**

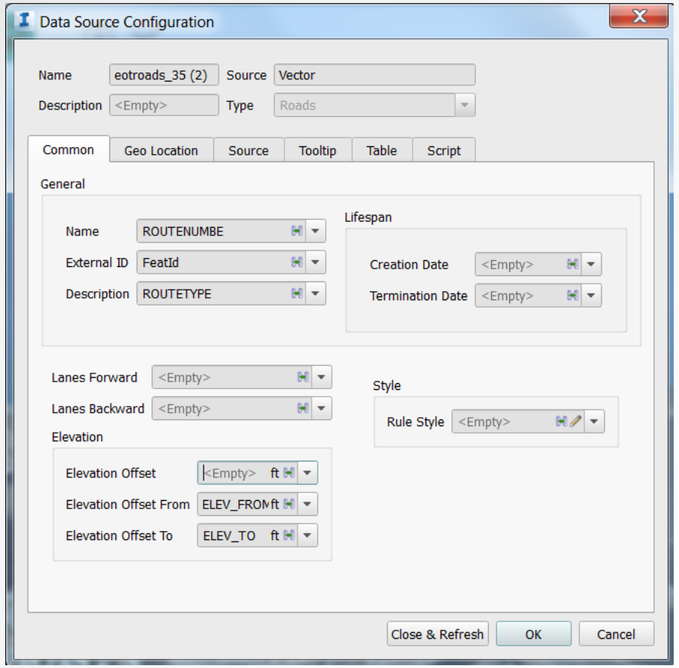
InfraWorks 360 uses JavaScript as its scripting language.

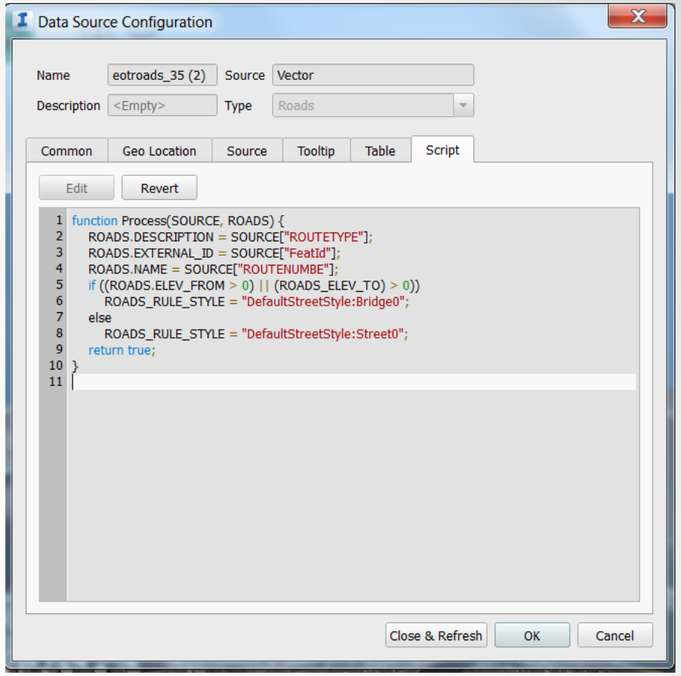
**Important**: It should be noted that the current JavaScript is “un-supported” by Autodesk.

- APIs are being enhanced and have not been locked down.
- Scripts using this “un-supported” API may require changes to execute when the final API is released.

# Type of Scripts:

- Project-specific




- Standalone (Not Project Specific)

```
var db = app.ActiveModelDb;

var coords = file.ReadFile("c:/Temp/BuildingInformation.csv");
var coordsa = coords.split("\n");

for (var i = 0; i < coordsa.length; i++) {
        var txta = coordsa[i].split(",");
        if (txta.length < 6)
                continue;
        buildingUpdate(txta[0], txta[1], txta[2], txta[3], txta[4] , txta[5]);
}
```

## CSV File

```
// Reads the entire contents of a CSV file into a variable 'coords'
// Splits the 'coords' string into an array of substrings, using a new line character as
//       a separator
// For each array string…
//      Split into an array of substrings, using the ',' as a separator,
// Ensure there are 6 substrings returned

// Call the buildingUpdate function passing the 6 returned building attributes
```

```
var buildingUpdate = function (name, description, area, type, built, usage) {
	var table = db.Table("BUILDINGS");                                  // Access the building feature database records
	if (table.QueryIsEmpty("") == true) {
		print("No buildings.");
		return;
	}
	var filter = "NAME LIKE '" + name + "'";                            // Create a filter to search the existing building database
	var extent = table.QueryExtent(filter);
	table.StartQuery(filter);
	table.BeginWriteBatch();
	var read;
	var invalidateTC = false;                                           // Create a "read" record structure
	var write = table.GetWriteRow();                                    // Create a "write" record structure
	while (read = table.Next()) {                                       // Populate the "read" with existing building features
		if (read.NAME == name) {
			write.DESCRIPTION = description;                            // Populate the "write" record structure
			write.USER_FLOOR_AREA = area;
			write.USER_BUILDING_TYPE = type;
			write.USER_YEAR_BUILT = built;
			write.USER_ANNUAL_ENERGY_USE = usage;
			table.UpdateFeature(write, read.ID);                        // Update the building feature with the "write" record
			write.Invalidate();
			invalidateTC = true;
			break;
		}
	}
	table.EndQuery();
	if (invalidateTC) {
		app.InvalidateTileCache(db.TableIndex("BUILDINGS"), extent);
	}
	return;
}
```

# Using Model Explorer Subsets to Build Selection Sets

**Simple Filter**: Specifies a property, an operator, and a value. For example, ***ROOF_HEIGHT > 24***. The subset defined by that expression includes only buildings whose roof height value is more than 24 feet.

**Multiple-Condition Filter**: Combines two or more simple filters. For example, ***ROOF_HEIGHT > 24 AND BUILDING_TYPE = 'Office***'. The subset defined by that expression includes only buildings whose roof height value is more than 24 feet and that are Office buildings**.**

**Location Filter**: Specifies an area in the model. Features within this area are included in the subset, while those outside the area are not. For example, you can include features within a radius from a known location in the model.

# Using Model Explorer Subsets to Build Selection Sets

**Example**: Select all City buildings within ~1500 feet radius of a known location/landmark where the buildings have a roof height of at-least 50 feet.

**[LOCATION:INSIDE.POLYGON.ID1] AND ROOF_HEIGHT > 50**

**Example**: Select all City roads within ~1500 feet radius of a known location/landmark that have a road condition index is > 7.5 (where 1 is poor and 10 is excellent).

**[LOCATION:INSIDE.POLYGON.ID1] AND USER_CONDITION_INDEX > 7.5**

# Applying User-Defined / Custom Styles to New InfraWorks 360 Models

**Objective**: Automatically include custom styles in all newly created InfraWorks 360 models

**Workflow 1:** (***Non-Model Builder Generated Models***)

**Step 1:** Create an empty model and use it to store all your custom styles.

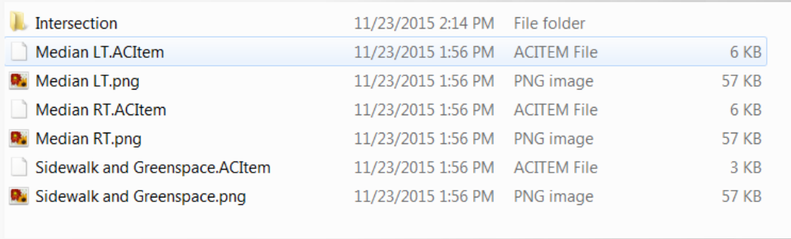
**Step 2:** Duplicate this model to start a new model and name it accordingly.

# Applying User-Defined / Custom Styles to New Models

**Workflow 2: *(Model Builder Generated Models)***

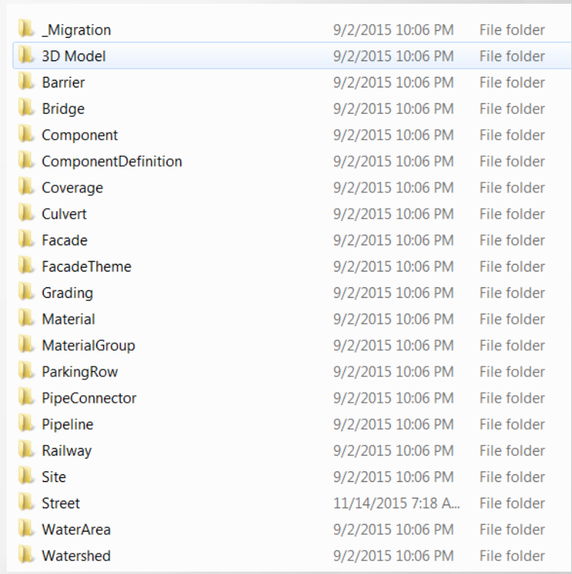
**Step 1**: Navigate to the folder where the existing model's custom styles are stored.

- Styles are stored within existing models here:
  ***<InfraWorks Model directory>\<model name>.files\unver\Content\Styles\<style type>***
  where the InfraWorks model directory is typically:
  ***%USERPROFILE%\Documents\Autodesk InfraWorks Models***




- For each style there is an **ACItem** file and a corresponding image file.

**Step 2**: Copy the custom styles from this location into the local library where the base styles are stored for the local machine.

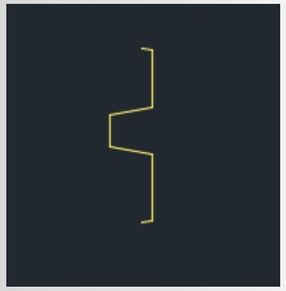



- The local Styles library can be found here:
  - ***%ProgramData%\Autodesk\InfraWorks 360\Resources\LocalLibrary\Styles\<style type>***

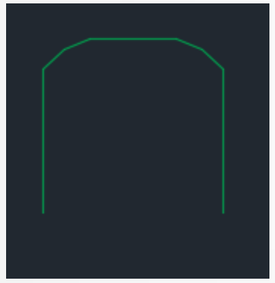
# Custom Profiles in Road and Rail Styles

- 2D cross section of linear features such as barriers, pipelines, guardrails, and fences
- Created in an external application (such as AutoCAD Map 3D) in SDF or SQLite format
- Imported into InfraWorks 360 and attached to a road or railway style.
- 2D cross section is extruded along the length of the selected road or railway track

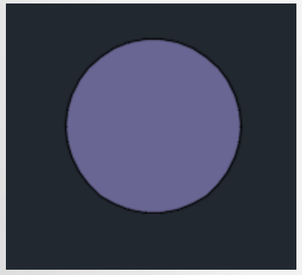
**Crash Barrier**



**Rounded Tunnel**



**Cable**



**Workflow Video**

# Creation and Visualization of Intersections

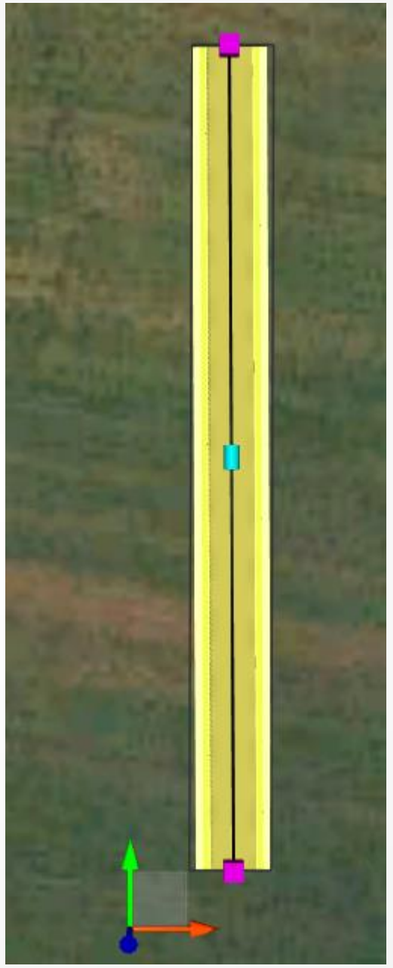
**Earlier Challenges:**

- Setting up Style Zones and Forward Lane Zones
- Difficulty lining up the through lanes at an intersection when there are left, through and right turn lanes
- Earlier limitation where it is not possible to create an intersection from 4 disjointed roads.

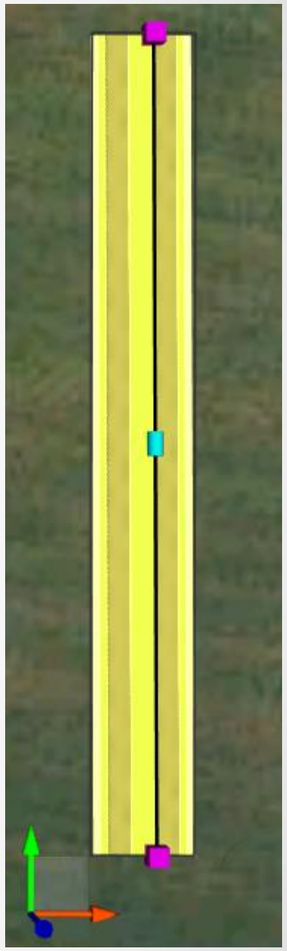
# Creation and Visualization of Intersections

**Step 1:**
Create 3 roads styles to handle the following conditions

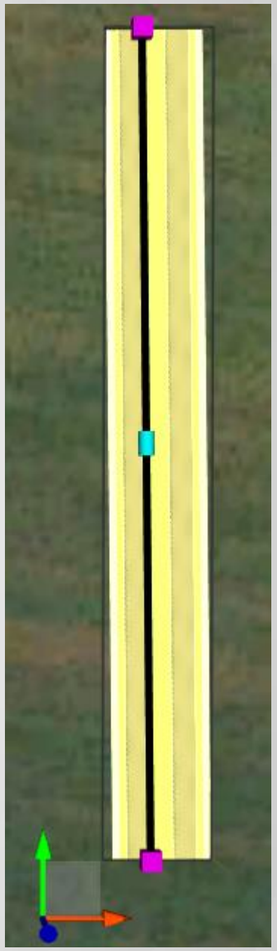
- Traditional roadway with green-space and sidewalk
- Asymmetrical road with a median on the right side of the centerline
- Asymmetrical road with median on the left side of the centerline



**Traditional Roadway**



**Median RT**



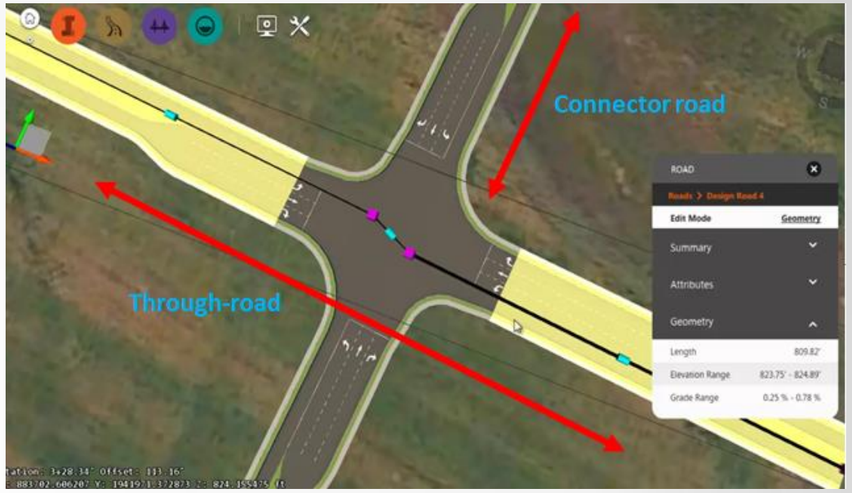
**Median LT**

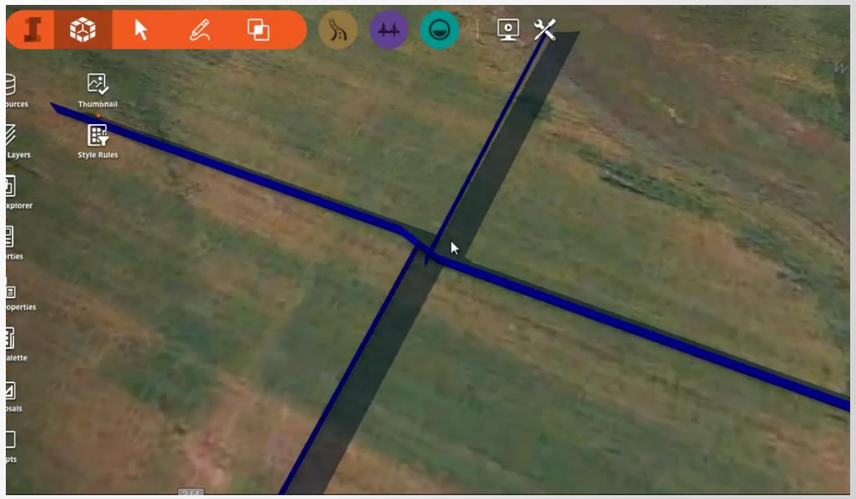
# Creation and Visualization of Intersections

**Step 2:**
Create the geometry for the through and collector roads

- Expedite the layout by using the provided intersection template (FBX)

- Configure as a **City Furniture** feature and use **Interactive Placing** to place it at the desired location on the model.




**Workflow Video**

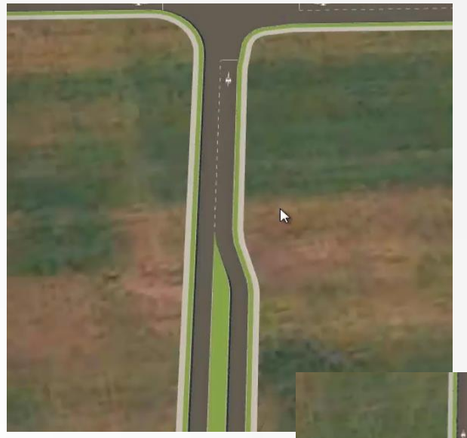
# Creation and Visualization of Intersections

**Step 3:** Create and apply a **Style Zone** on the southern approach using the **Median RT** style.

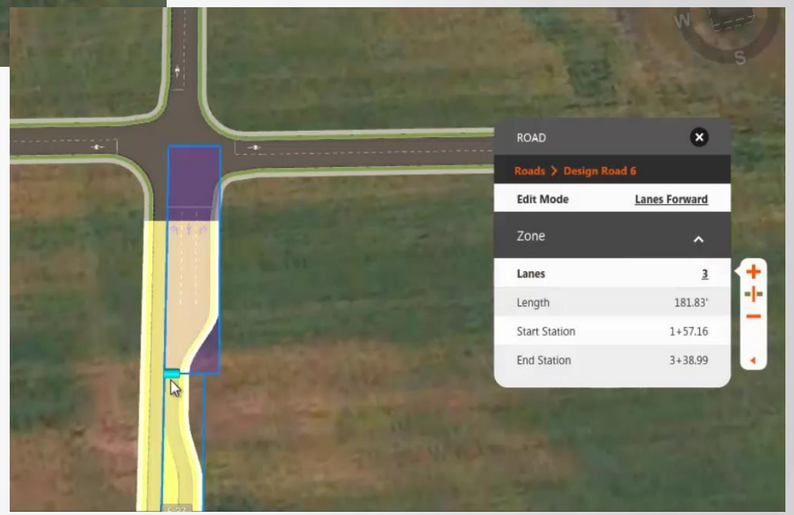
**Step 4:** Create and apply a **Forward Lane Zone** and specify 3 lanes (left, through and right)

**Step 5:** Repeat the same process for the opposite connector road approach road.

**Step 6:** Follow the same process for the through road except create a lanes forward zone that ends in the middle of the kink and then set the start point.



**Workflow Video**

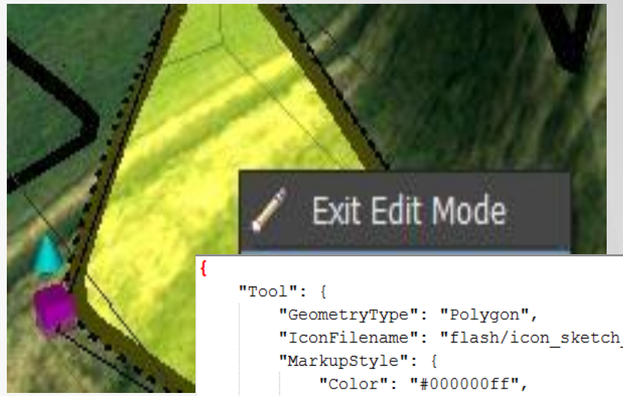



**Workflow Video**

# Manipulating Coverage Areas

## Terrain Shaping

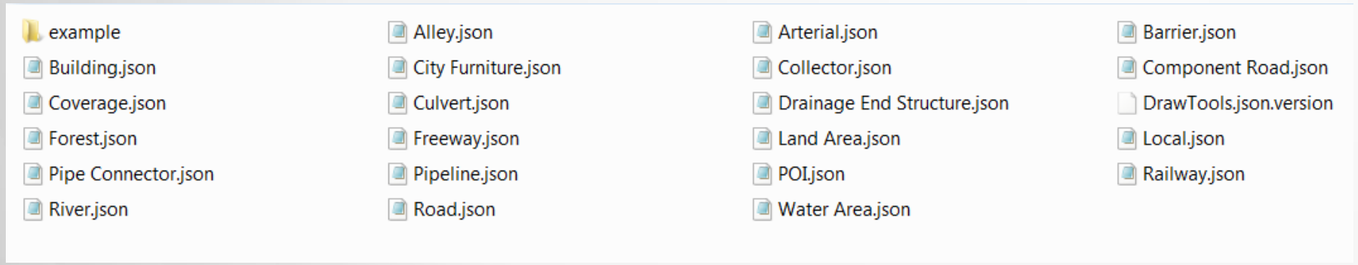
Flatten a coverage area and set the elevation of that coverage




## Controlling Coverage Area Corner Radii

Adjust the **SmoothParam** value in respective JSON file typically located at:

***<InfraWorks Models Folder>\<Model Name>.files\unver\DrawTools***

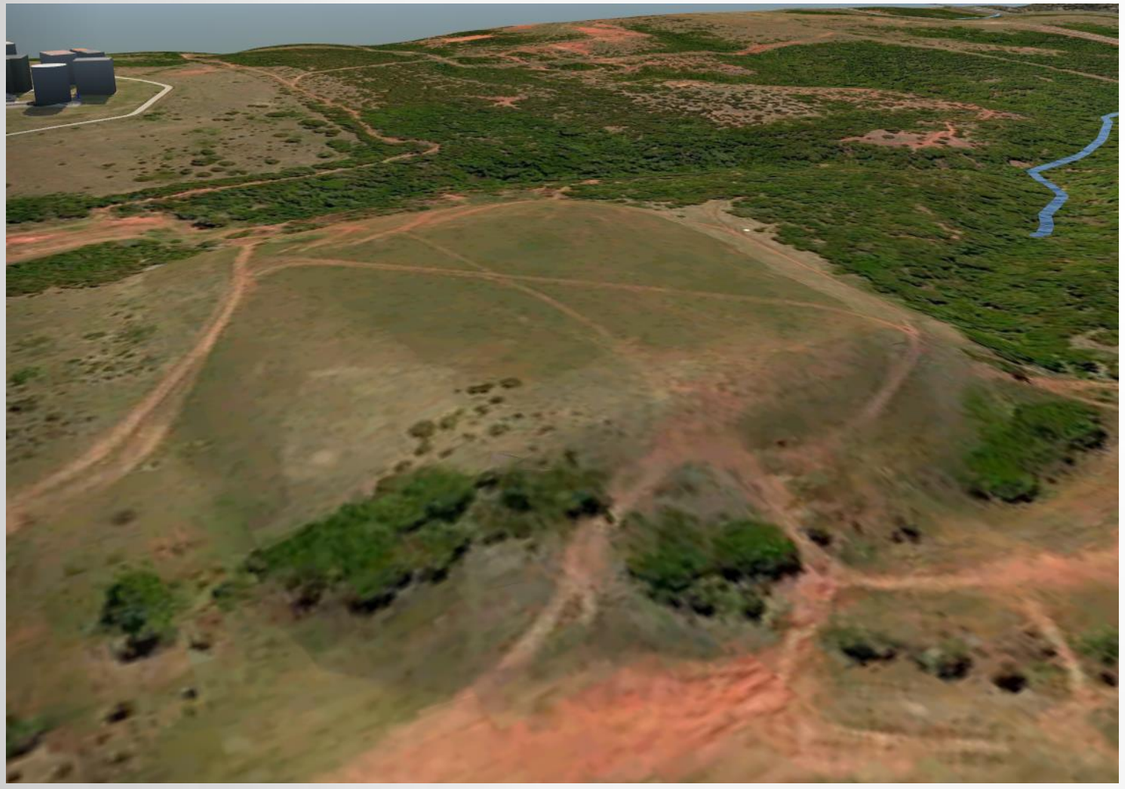


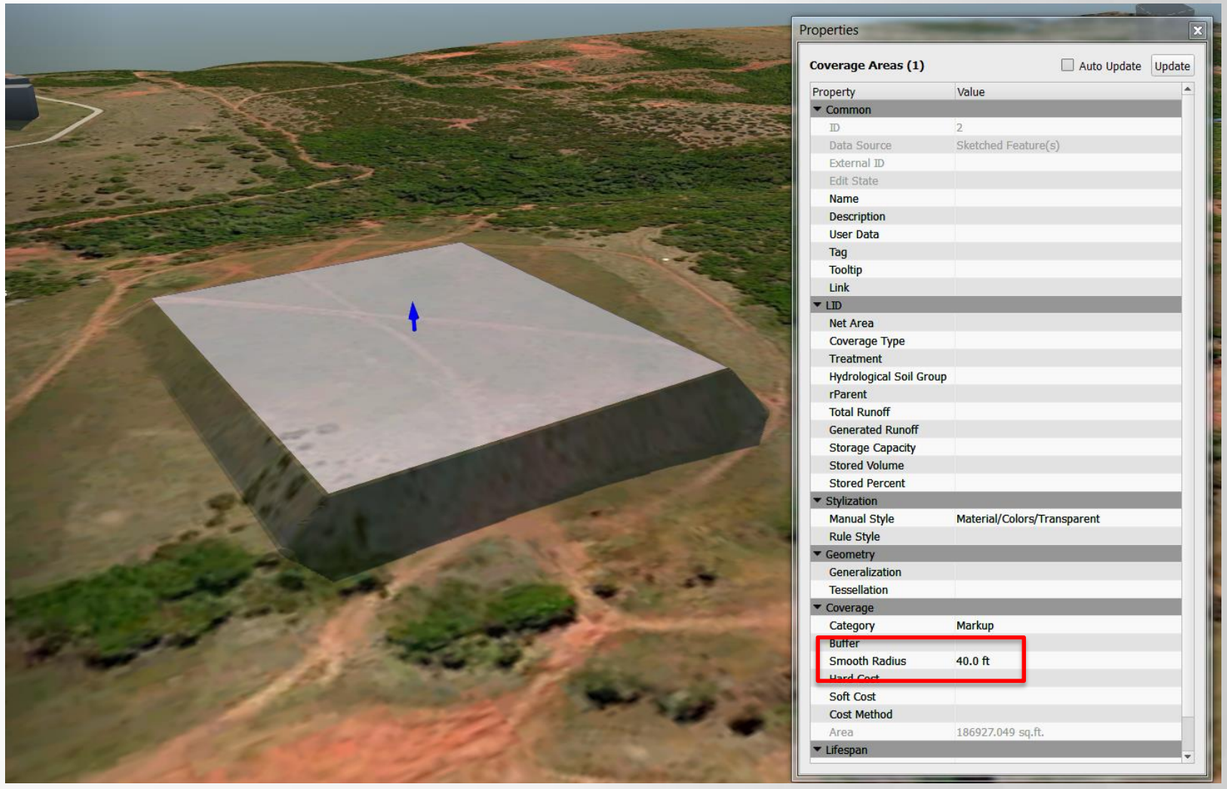

```
{
    "Tool": {
        "GeometryType": "Polygon",
        "IconFilename": "flash/icon_sketch_coverages",
        "MarkupStyle": {
            "Color": "#000000ff",
            "BaseAssetType": "COVERAGES",
            "DrawControlPolyline": true,
            "FillFile": "styles/symboldef/Terrain.sd",
            "FillScale": 5.0,
            "HeightOffset": 0.5,
            "ScaleX": 1.0,
            "ScaleY": 1.0,
            "SmoothParam": 0.0
        },
        "Snaps": [
            {
                "TargetClass": "COVERAGES",
                "Distance": 1.0,
                "Type": 6
            },
            {
                "TargetClass": "WATER_AREAS",
                "Distance": 5.0,
                "Type": 6
            }
        ],
        "AllowEdit3d": true,
        "DefaultProperties": {
            "CATEGORY": "Markup"
        }
    }
}
```

# Manipulating Coverage Areas

## Coverage Area Slopes

- Adjust the Coverage Area property **Smooth Radius**
- A value of 0 will get a near straight vertical wall.

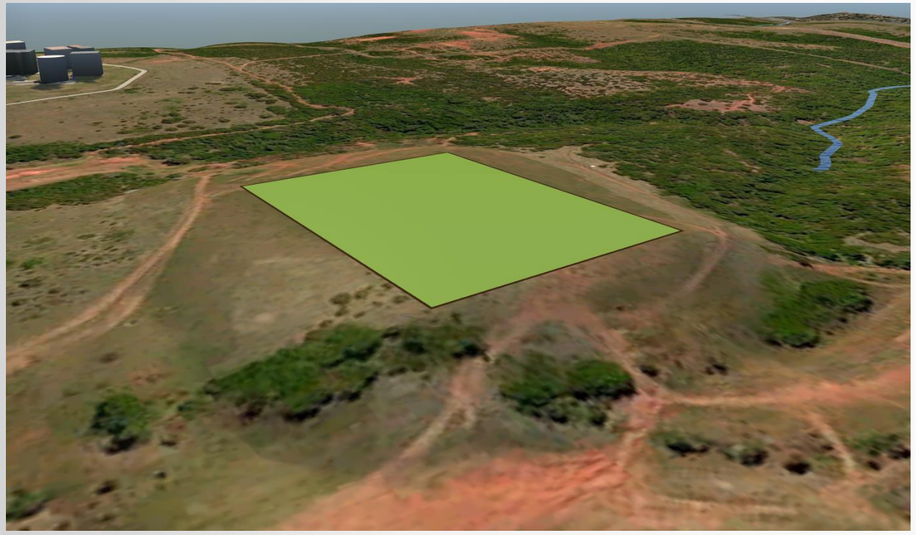


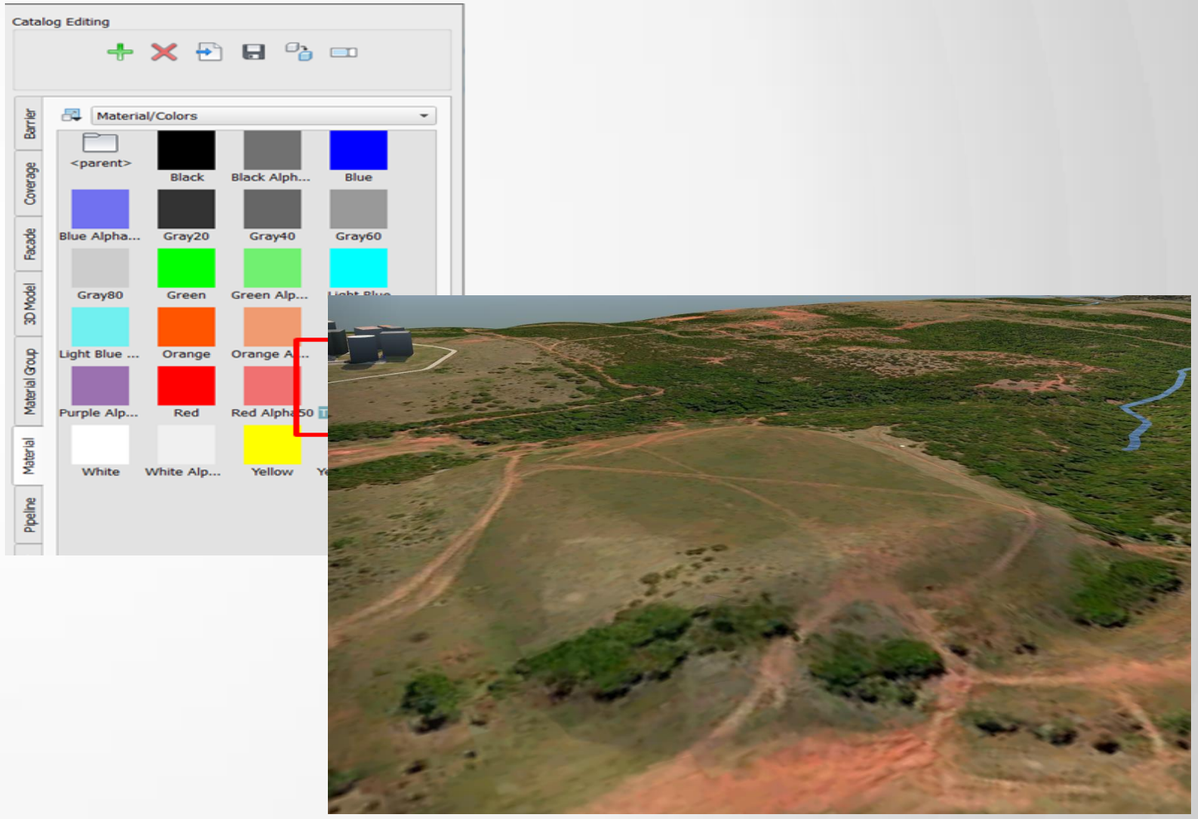


# Manipulating Coverage Areas

## Applying Transparent Styles to Coverage Areas

Assign a **Transparent** color to the Coverage Area to see through to the underlying terrain texture or imagery.

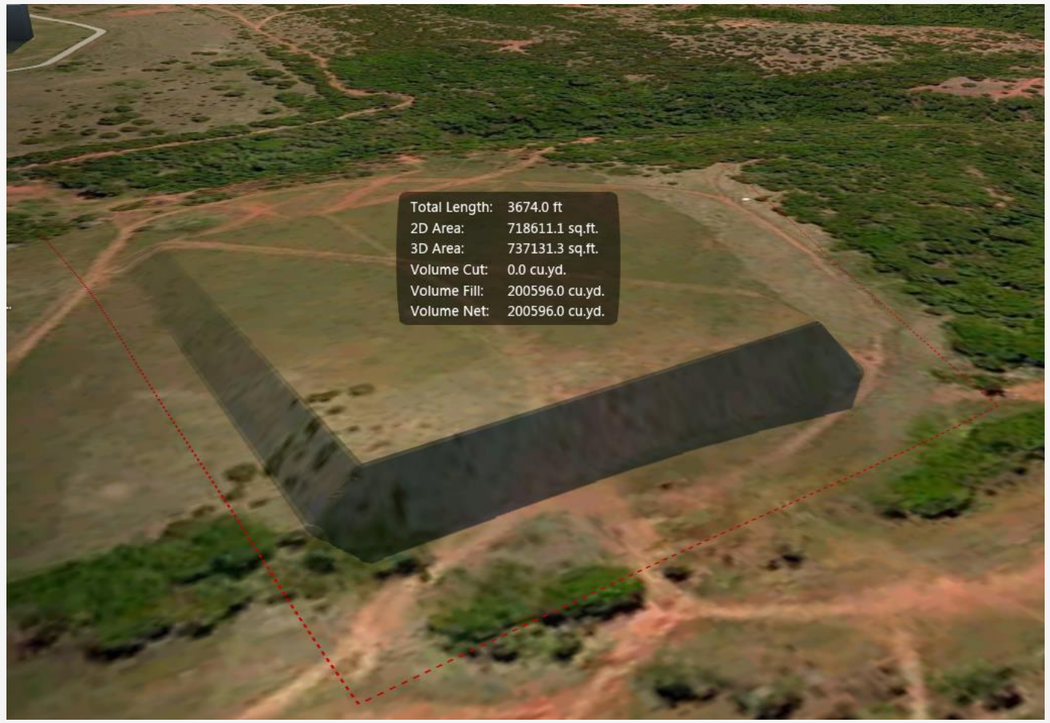




# Manipulating Coverage Areas

**Generating Cut and Fill Volumes using Coverage Areas**

Calculate and display the surface volume information (cuts and fills) resulting from a coverage area being adjusted for location and /or height.

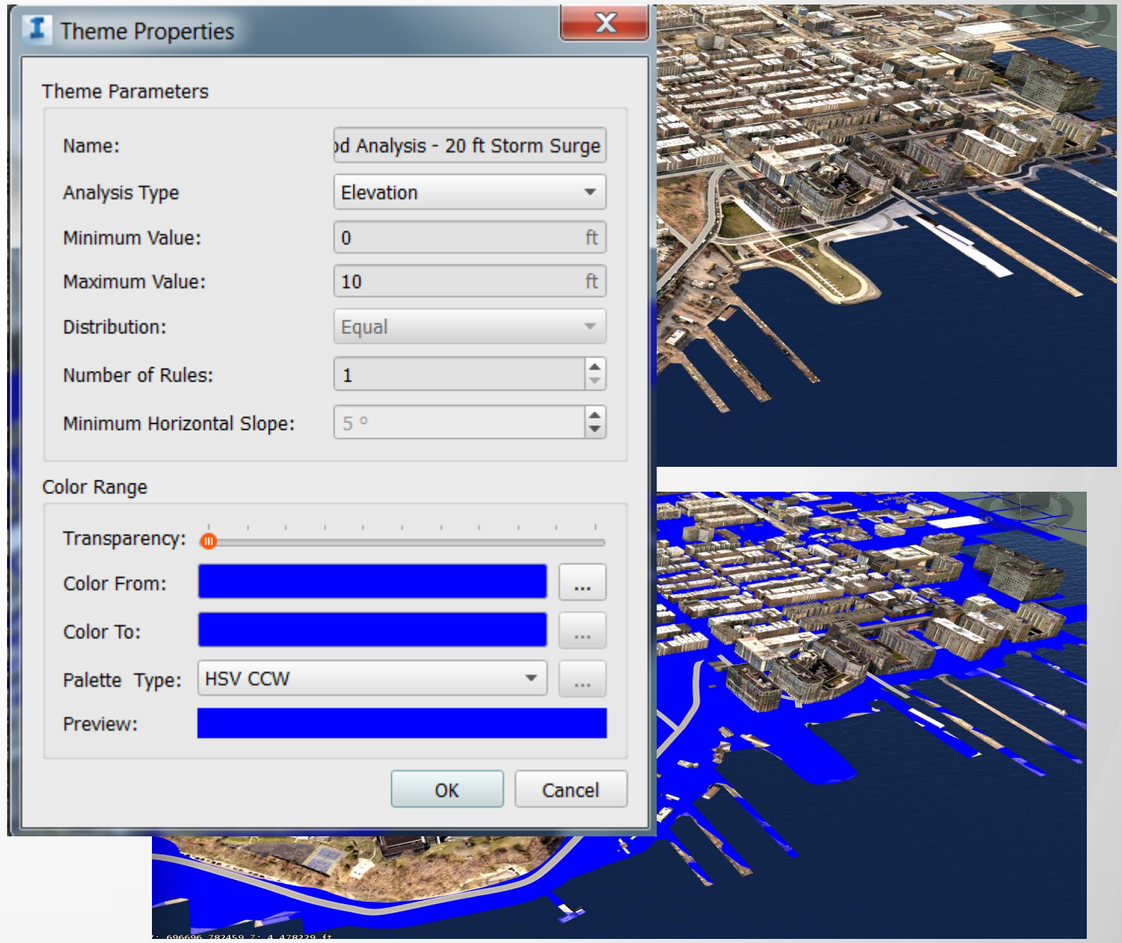


# Creating and Visualizing a Flood Surface – Bath-Tub Approach

**Workflow:**

**Step 1:** Create a Terrain Theme
**Step 2:** Set ***Analysis Type*** to ***Elevation***
**Step 3:** Set ***Minimum Value*** to 0
**Step 4:** Set ***Maximum Value*** to 10
**Step 5:** Set ***Number of Rules*** to 1
**Step 6:** Select the same color for ***Color From*** and ***Color To***

**Impact of a 10 Foot Storm Surge**



# Creating and Visualizing a Flood Surface Using ESRI GIS Data and Civil 3D Surface

## Workflow:

**Step 1:** Import the flood surface model (for example ESRI GRID (.adf) file) into Civil 3D as a surface

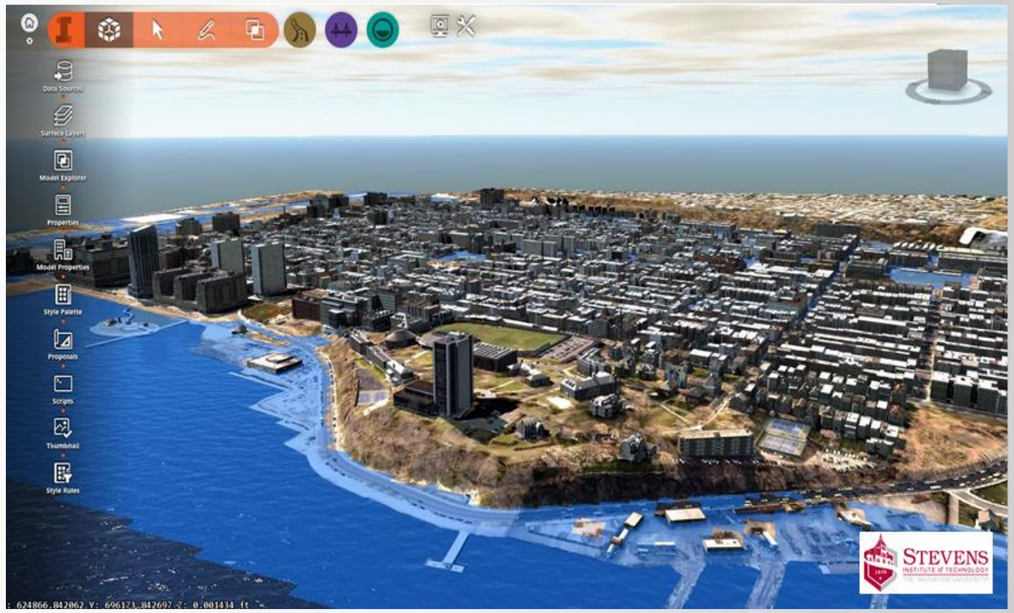
**Step 2:** Assign a water material to the created surface

**Step 3:** Save the surface as an FBX model file from Civil 3D

**Step 4:** In InfraWorks 360, import the FBX file as a 3D Model (under **Data Sources**) and assign it as a "**Points of Interest**" feature type. Make sure you assign the appropriate Coordinate System.

**Step 5:** Close and Refresh.

The flood elevation in the file is occurred at 21:30 EDT, Oct 29, 2012, the moment when the Hudson River was at its highest off the Castle Point.




Flood was modeled using sECOM (Stevens Estuary and Coastal Ocean Model) based on hydrodynamics. The model results were validated by all the available sources in Hoboken - high water marks, photos/videos, and crowd sources (witnesses).

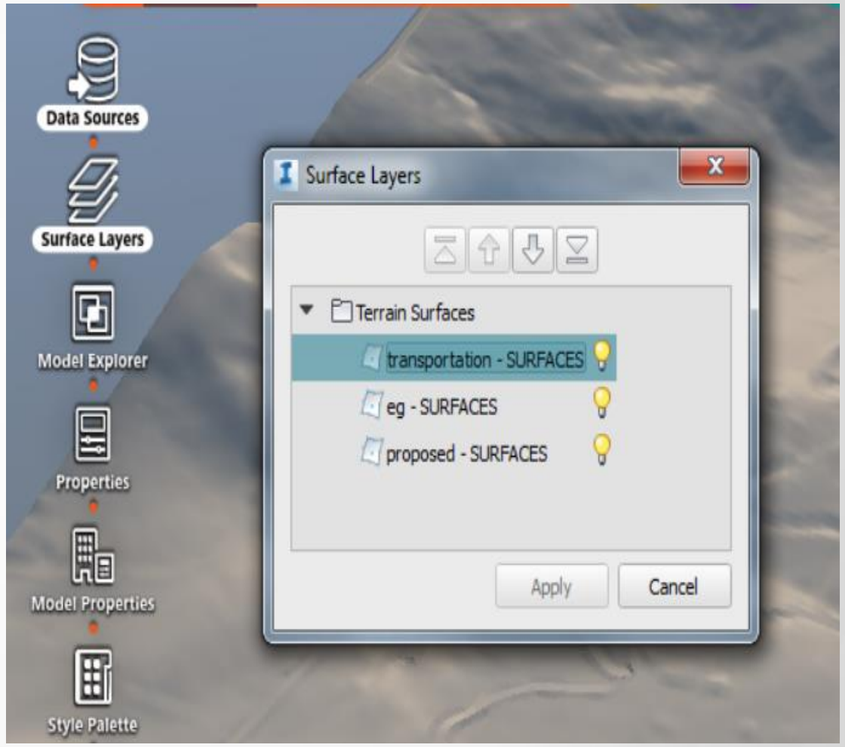
# Layering Multiple Civil 3D Surfaces in InfraWorks 360

**Step 1:** Import the IMX file into InfraWorks 360 using the **Data Sources** feature. A list of all surfaces in the IMX is displayed.

**Step 2:** Select the first surface to be imported.

**Step 3:** Continue the same process to import the other IMX surfaces to create separate surfaces in InfraWorks 360. Each surface is placed on a separate layer

- Control the display order and visibility of each of the imported surfaces using the **Surface Layers** tool.




**Workflow Video**

# InfraWorks Model Exchange with Civil 3D

**Workflow 1 - Preliminary Design in InfraWorks 360, Detailed Design in Civil 3D:**

1. Create a new drawing in Civil 3D
2. Select **Open InfraWorks 360 Model on** Civil 3D 2016 **Insert** menu
3. Select the InfraWorks model (.sqlite)
4. Set a coordinate system for the empty Civil 3D drawing
5. Bring in either the entire InfraWorks 360 model (or within a defined Area of Interest).
6. Map InfraWorks 360 objects to Civil 3D objects using a setting configurations file
7. Refine what you need to bring in from InfraWorks 360 (Terrain Surfaces, Planning Roads, Planning Utilities, Design Roads, Intersections, Drainage Networks with same part sizes, etc.)
8. Click on **Open Model**


**Workflow Video**

# InfraWorks Model Exchange with Civil 3D

## Workflow 2 - Moving a Civil 3D Design into InfraWorks 360 for Visualization and Analysis

1. Create a new InfraWorks 360 proposal
2. Select **Data Sources** and select the **Autodesk AutoCAD Civil 3D DWG** option
3. Turn off all the surfaces that originated from the InfraWorks 360 preliminary design:
    - ***AIW_Existing_Ground***
    - ***AIW_Existing_Transportation***
    - ***AIW_Proposed_Ground***

4. Ensure that the **Roads**, **Corridor Surface** and **Coverage Area** options are turned on.
5. Configure the **Roads** feature.
    Exclude all the roads except the centerlines of the design corridors you want.
6. Bring in the Corridor Surface and Coverage Areas

**Workflow Video**

# Using Tooltips to View Asset and Performance Data

**Workflow:**

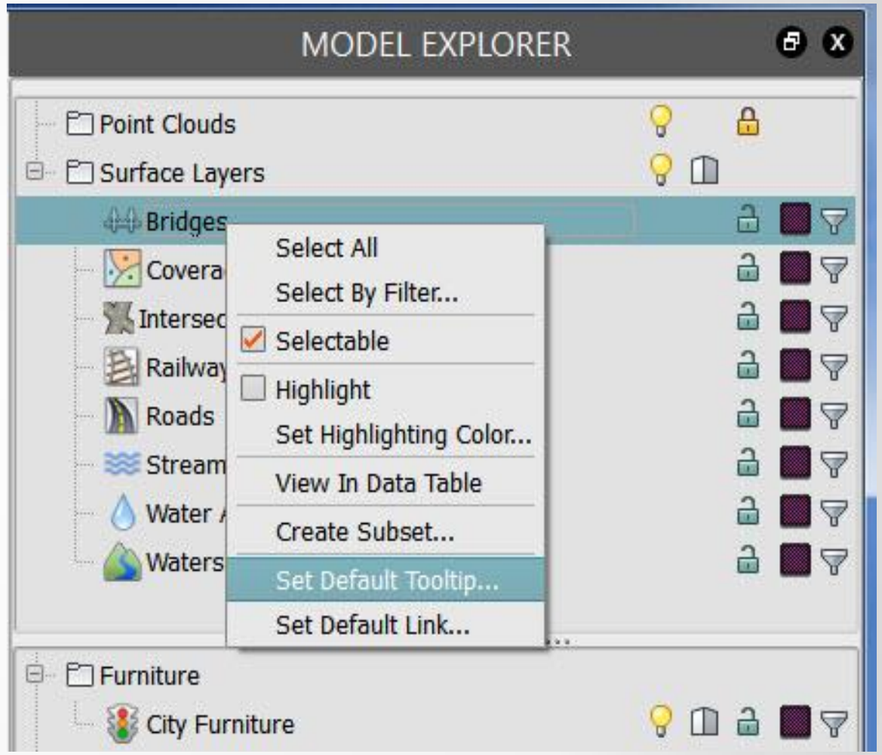
**Step 1:** Click in the **Utility** Bar to display the **Model Explorer**.

**Step 2:** Right-click the row for the feature class whose tooltip you are creating.

**Step 3:** Click **Select All** to apply the **Tooltip** to all objects in the feature class.

**Step 4:** Right-click the feature class row again and click **Set Default Tooltip** to open the **Edit Tooltip** window. Enter Tooltip content.

**Step 5:** Optionally, click **Preview** to see what the tooltip will look like.




**Workflow Video**

# Using Tooltips to View Asset and Performance Data

## HTML Basics:

 **Defines a Paragraph** 
 **Defines Bold Text** 
<u> **Defines text that should be stylistically different from normal text** </u>
<a href> **Defines a Hyperlink** </a>
<font> **Font** </font>
<img> **Defines an Image**
alt **– Defines alternative text for image**
  **No Break Space**

## InfraWorks 360 Feature Class Attributes:

**Out-of-box:** %<Attribute Name>%
For Example:
%NAME%
%DESCRIPTION%
%ROOF_HEIGHT%

**Custom Attributes:** %USER_<Attribute Name>%
For Example:
%USER_FLOOR_AREA
%USER_ANNUAL_ENERGY_USE
%USER_YEAR_BUILT

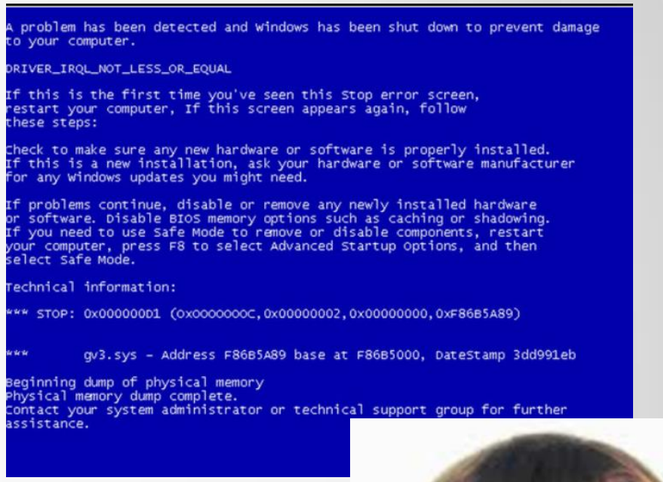
# Using Tooltips to View Asset and Performance Data

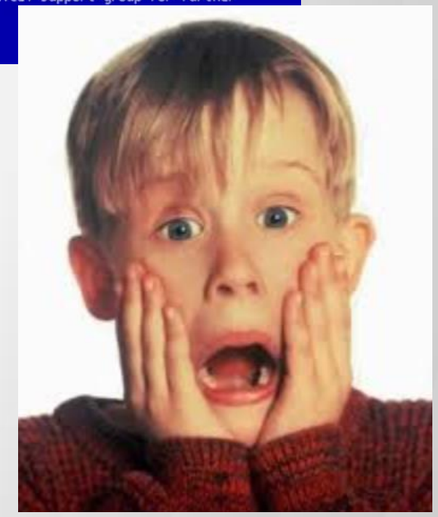
```
<p><b><u>ASSET INFORMATION:</u></b></p>
<p><font>Building ID: </font>%NAME%</p>
<p><font>Building Description: </font>%DESCRIPTION%</p>
<p><font>Gross Floor Area: </font>%USER_FLOOR_AREA%</p>
<p><font>Year Built: </font>%USER_YEAR_BUILT%</p>

<p><b><u>Energy Information:</u></b></p>
<p><font>Annual Energy Consumption (kWh): </font>%USER_ANNUAL_ENERGY_USE%</p>

<img
src="http://chart.apis.google.com/chart?chxr=0,0,5&amp;chxt=y&amp;chbh=a&amp;chs=150x150&amp;cht=bvs&amp;chco=AA0033,FFCC33&amp;chds=0,150,0,150&amp;chd=t:0,0,0,0,0,0|40,80,100,90,120&amp;chma=|5&amp;chtt=Energy Usage" width="150" height="150" alt="Energy Usage">


<p><b><u>Associated Files</u></b></p>
<p><font>3D Model: </font>          <a alt="Click to open 3D model"
href="C:\Data\Projects\%NAME%\%NAME%.dwfx" target="_blank"><img src="file:///C:\Data\Project\%NAME%\%NAME%.gif" height="100"
width="100" align="middle"></a></p>
<p><font>As-built Drawing</font>: <a alt="Click to open drawing" href="C:\Data\Project\%NAME%\%NAME%.dwg" target="_blank">Plan
View</a></p>
<p><font>Fly-Over Video</font>: <a alt="Click to open drawing" href="C:\Data\Project\%NAME%\%NAME%.wmv" target="_blank">Fly-
Over</a></p>
```

# InfraWorks 360 Troubleshooting and Performance Tips

## Potential Issues:

- The model has crashed several times and now the user is unable to create new proposals.
- Autodesk InfraWorks 360 launches successfully, but the project crashes each time I try to load it.
- When opening a project, I see an error message that the database schema is unknown.
- The project cannot be opened after upgrading the model to a later version.



# InfraWorks 360 Troubleshooting and Performance Tips

## Workflow 1A - Simple and Less Potential for Data Loss

1. Close InfraWorks 360

2. Navigate to the **TileCache** folder found at:
   ***C:\Users\<current user>\AppData\Local\Autodesk\Autodesk InfraWorks\cache\16.3***

3. Empty the contents of the **TileCache** folder without deleting the folder itself. This will cause the project to rebuild once you try and open it again.

# InfraWorks 360 Troubleshooting and Performance Tips

## Workflow 1B - Simple and Less Potential for Data Loss

**Step 1:** Reboot your machine.

- Ensures that no stray 'git' processes are still running.
- Perform this step even after exiting or ending the InfraWorks 360 desktop process.

**Step 2:** Browse to the two hidden ***.git*** file folders in the project directory [you may need to turn on hidden files/folders in Windows Settings].

- Project files location is ***C:\Users*current user*\Documents\Autodesk InfraWorks Models*.**
- The 2 ***.git*** folder locations are:
  ***…\Autodesk InfraWorks Models\<modelname>.files\.git***
  ***…\Autodesk InfraWorks Models\<modelname>.files\ \unver\.git***

**Step 3:** Check for and delete the ***index.lock*** files in each of the above folders.

Note**:** If the index file does not contain a ***.lock*** file, do not delete the index files. The ***.lock*** extension only appears when the project crashes. Deleting the Index file will not help in the recovery of your project.

**Step 4:** Launch InfraWorks 360 and attempt to load your project.

# InfraWorks 360 Troubleshooting and Performance Tips

## InfraWorks Database Setup

- Every InfraWorks 360 Model consists of:
  - **<Model>.files** folder
    - Model data
    - 2 GIT Repositories that stores a history of all changes in a model
      - Feature Data (Feature Repository)
      - Non-Feature Data (Meta Repository)
  - **SQLite File** - SQLite version of the feature model data.

## General Recovery Process

- Perform any recovery of the GIT repositories (both feature and meta repositories)
- Recreate the model data by checking out valid revisions of the GIT repositories
- Perform additional manual cleanup of the model data
- Recreate the GIT repositories using the current set of model data
- Recreate the SQLite using the feature model data

# InfraWorks 360 Troubleshooting and Performance Tips

**Workflow 2 -** Remove the InfraWorks database's uncommitted modification history to remove any "toxic" changes that may have occurred.

**Step 1: GIT Repository Recovery**

- Test the integrity of the GIT repositories.
- Run "**GIT fsck**" from same folder as the GIT repository
  - The ***GIT.exe*** can be found at ***C:\Program Files\Autodesk\InfraWorks 360\Git\bin***
  - Copy the ***libiconv-2.dll*** as well

## Good Model

```
C:\Users\mathaim\Documents\Autodesk InfraWorks Models1\Hollywood.files\.git>git
fsck
Checking object directories: 100% (256/256), done.
Checking objects: 100% (188/188), done.
```

## Bad Model

```
bad sha1 file: .git/objects/0d/3ff31b1e959df784193fb70eafc792e0e2f564 (1)
...
bad sha1 file: .git/objects/ff/44e35a18192359d3f9ed60bec784f2f4f04d16 (1)
Checking object directories: 100% (256/256), done.
broken link from    tree 476c22ab9729b8415f1fb0f840b9fa467a1b6477
              to    blob 5cc368661cf59648b69af6bf9a4f985f8bcb683e
broken link from    tree f96bf89d74650caeeb9cdf2078a5aecdf15897b3
              to    blob f0e26b40d69872ca2f19a372cae642f127429f63
dangling commit 7be0ee3c883864cf945cc67231933a6613556192
missing blob f0e26b40d69872ca2f19a372cae642f127429f63
missing blob 5cc368661cf59648b69af6bf9a4f985f8bcb683e
dangling commit 0186cd4503e40af6d08f968e758835a00411b676
dangling blob 25877e481b9ae3d875273de7908dba21924fe56b
missing blob f04e699e1c0a48ae4623657eac9fa7bdcb766632
```

# InfraWorks 360 Troubleshooting and Performance Tips

**Step 2: Recreate GIT Repositories**

- Change to the directory containing the .git folder for the repository you wish to recreate
- Delete the .git folder
- Run the following commands:
  - git init
  - git add -all
  - git commit -m "Recreate repository"

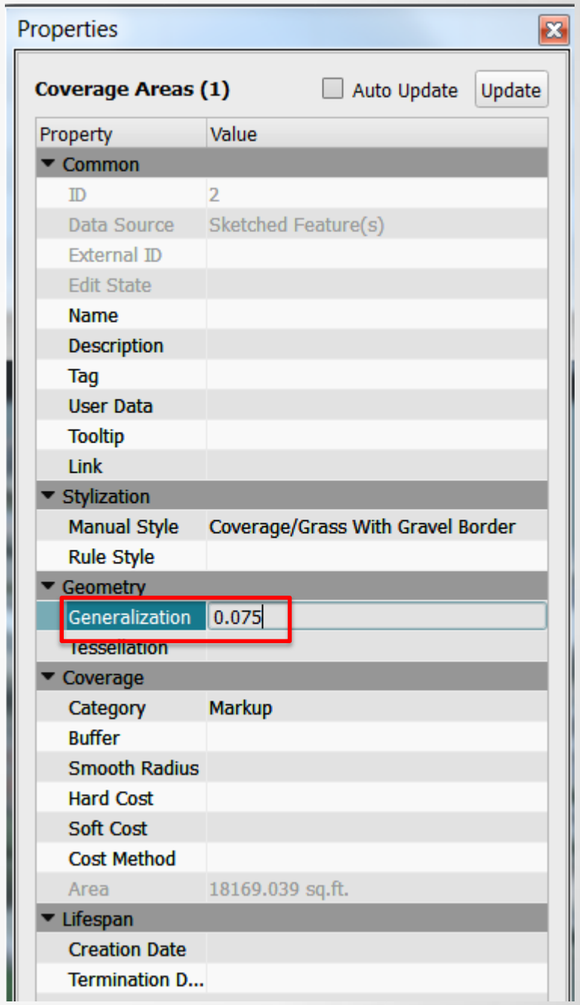
**Step 3: Recreate SQLite Files**

- Assumption: Model data and GIT repositories have been recreated

# Improving Model Performance

## Reduce Vertices in Coverage Areas

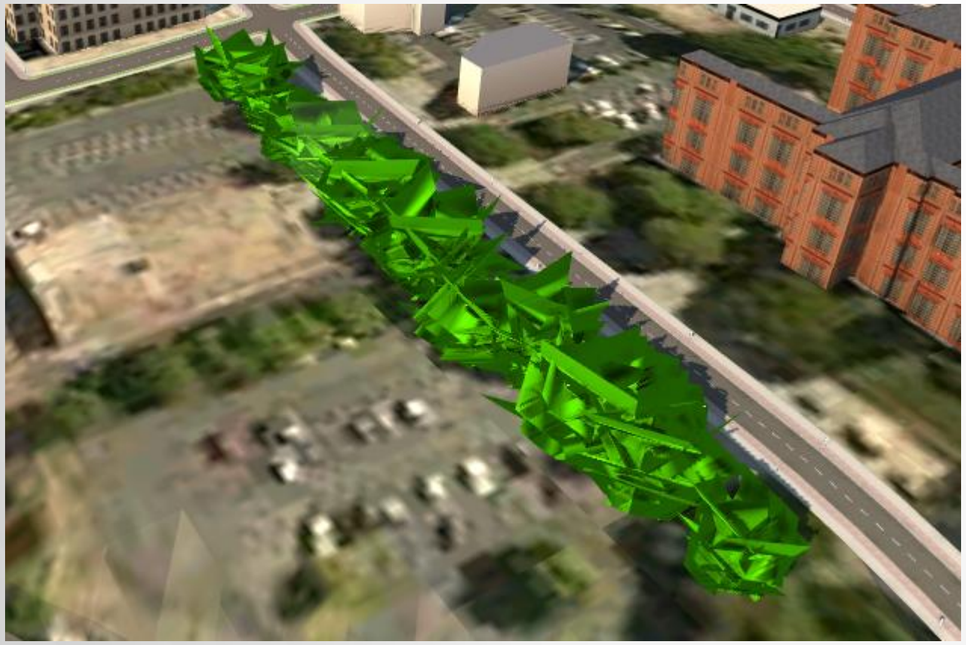
- Select all  the **Coverage Areas** using the Model Explorer
- Right mouse click and **Select All**.
- In the **Properties: Geometry** section enter a value of **0.075m** in the **Generalization** field.



# Improving Model Performance

## Replace Regular Tree Object with Low Polygon 3D Model

- Import as a 3D Model style (fbx, 3ds, obj, dae, etc.)
- Adjust the model scale as needed



# Improving Model Performance

## Optimize Models for Mobile/Web Use

- Change to smaller Area of Interest
- Reduce Number of 3D Models
- Reduce Complexity of 3D Models (Mesh Complexity) at the source and during import
- Tile or Texture Size may be too high
- Modify Settings to Optimize Scenario Publishing
  - Unver/Scenarios/JSON file
  - Can modify
    - Level of Detail (Low, Medium, High)
    - Tile Size (Default = -1)
    - Texture Size