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What's Beyond InfraWorks 360 LT?

Eric Chappell
Autodesk

Learning Objectives

- Learn how to identify the added benefits of InfraWorks 360 LT versus InfraWorks 360
- Discover the major features of Roadway Design for InfraWorks 360
- Discover the major features of Bridge Design for InfraWorks 360
- Discover the major features of Drainage Design for InfraWorks 360

Description

InfraWorks 360 LT software is a powerful tool, but it really comes alive when it's upgraded to InfraWorks 360 software, including the 3 industry-specific applications that address roads, bridges, and drainage. This class will build on basic InfraWorks 360 software knowledge and show the more advanced use of the industry-specific applications, as well as other features like Model Builder, Corridor and Profile Optimization, and InfraWorks 360 software in the cloud.

Your AU Expert

Eric Chappell serves as Community Evangelist for InfraWorks 360 at Autodesk. He is a recognized expert in InfraWorks 360 and has been writing and talking about it since its inception. He has over 20 years' experience in the civil/survey field having served as field surveyor, designer, CAD manger, consultant, trainer, and many other roles relating to Civil 3D and InfraWorks 360. His most recognizable work is a series of Essentials books for InfraWorks 360 and Civil 3D published by Wiley\Sybex. He resides in central Virginia and when he's not talking to folks about InfraWorks 360 he's spending time with his wife and four children, playing music, or enjoying the outdoors.

Introduction

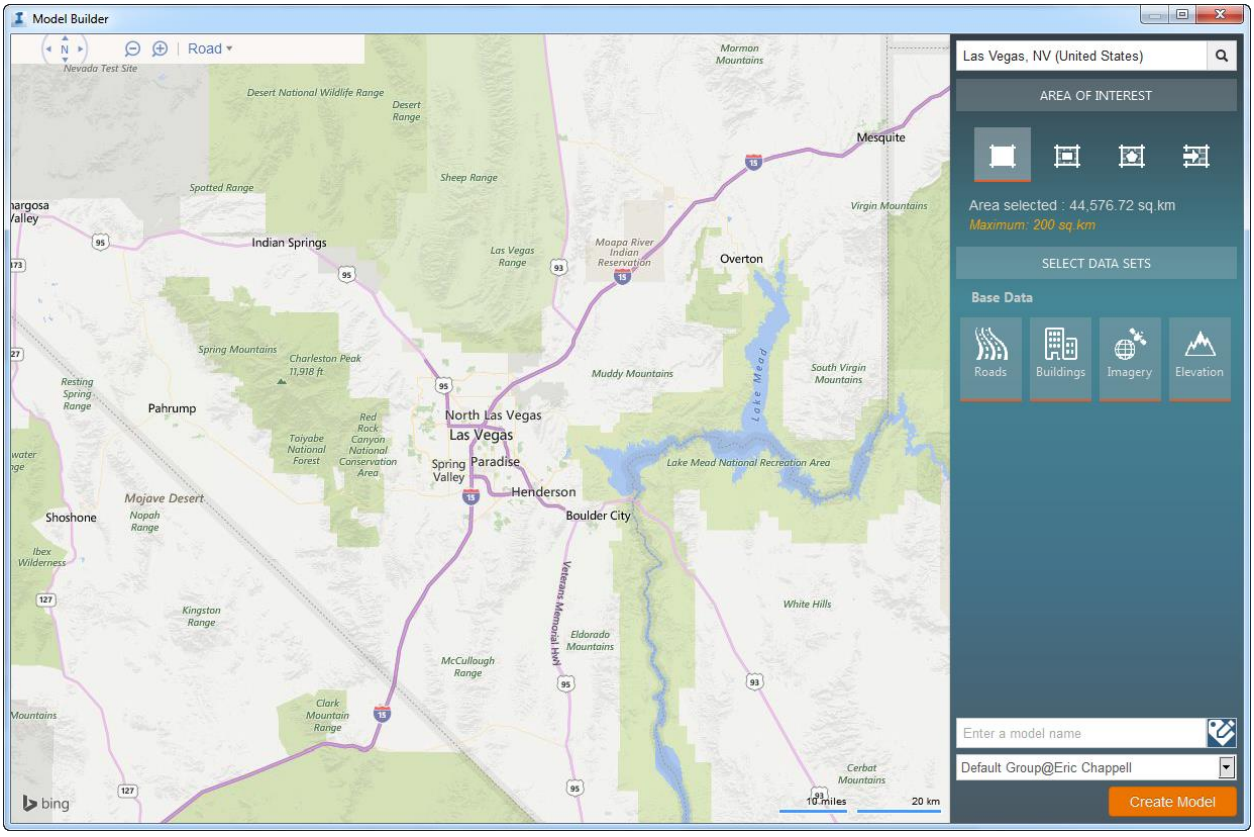
InfraWorks 360 LT is a powerful tool in its own right but when you add on the functionality of InfraWorks 360 along with the three vertical applications for road, bridge, and drainage design, you've got a tool set that is unrivaled for engineering-based preliminary design in a stunning 3D collaborative environment. There really is nothing like the full package of InfraWorks 360 offerings, and in this class you'll get an overview of all the major features and benefits. Hold on for an amazing ride!

InfraWorks 360

InfraWorks 360 brings three major capabilities to the table that go above and beyond InfraWorks 360 LT: Model Builder, collaboration tools, and the ability to plug in the vertical applications.

Model Builder

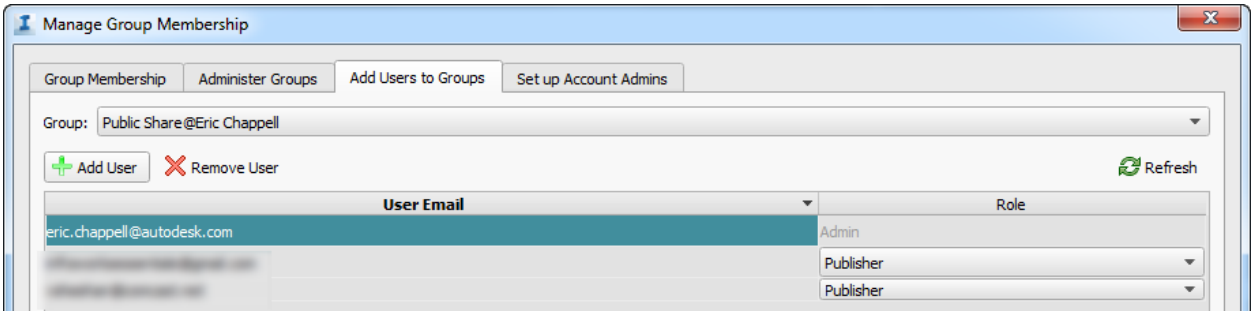
Model Builder is probably my most favorite and most used feature of InfraWorks 360. Because of this tool, you can create a model of nearly anywhere on the planet and be ready to start creating your design in about 10 minutes. All you have to do is launch Model Builder from InfraWorks 360 Home, zoom in and select your area, give your model a name, and wait a few minutes for the model to magically appear on InfraWorks 360 Home.



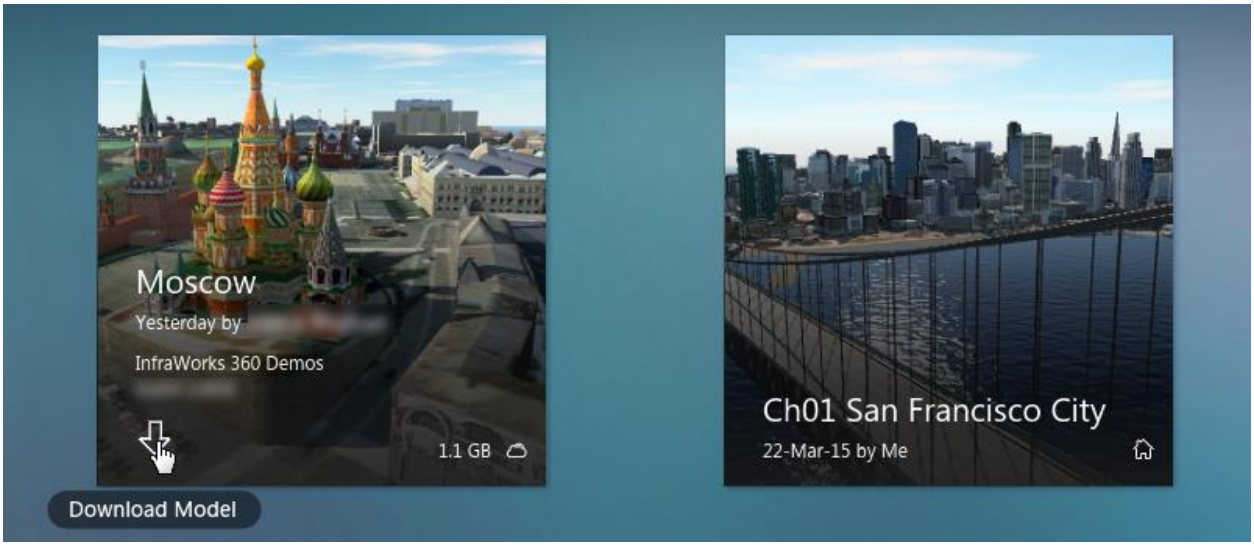
Collaboration

With InfraWorks 360 you can publish your models to the cloud via the InfraWorks 360 cloud service. Published models are organized in groups and you control the availability of models by inviting people to these groups. In other words, you don't invite someone to collaborate on a model with you, you invite

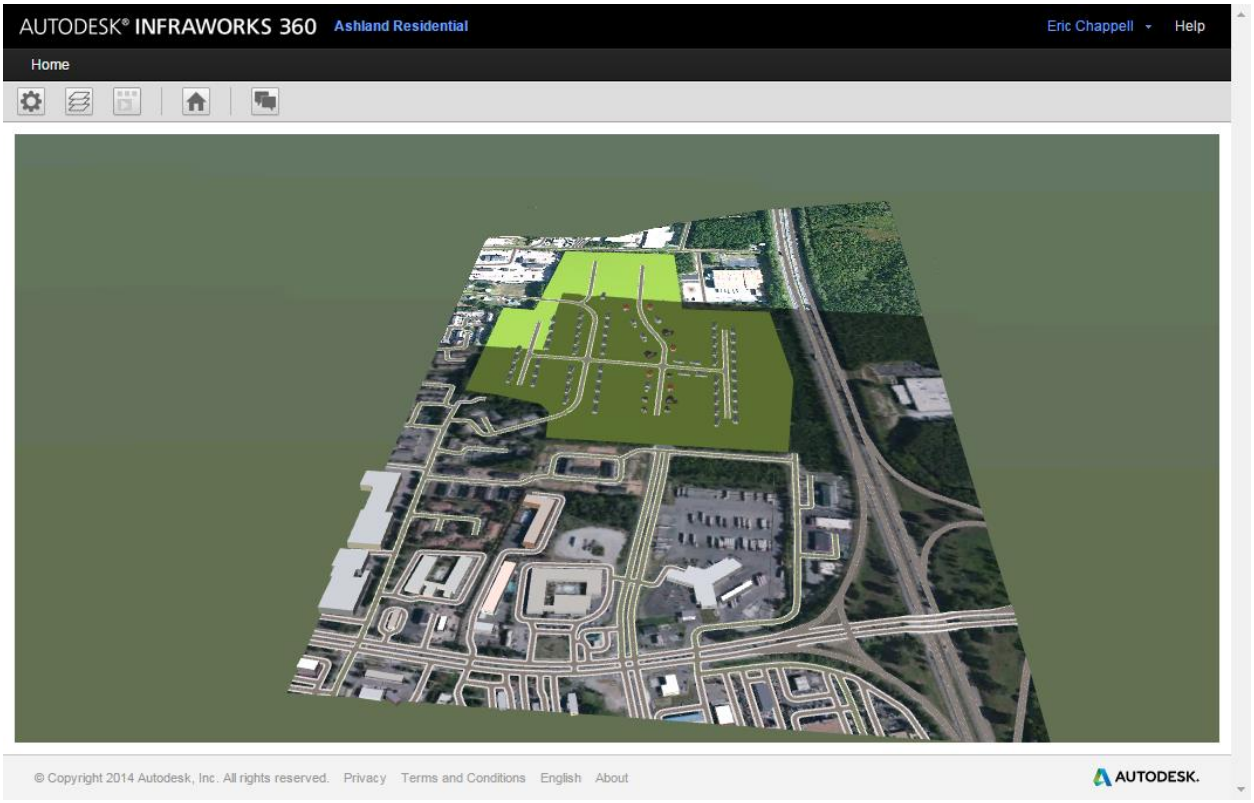
them to be a member of a group – and they will have access rights to any model associated with that group.



When a user has been invited to a group, and they accept the invitation, the models for that group will appear on their InfraWorks 360 Home. The user can download a model from the group and make modifications to it. If they've been given publisher or author privileges, they can sync their changes back up to the cloud version of the model, and when other members of the group sync the model, those changes will be applied. Multiple collaborators can contribute to a model and the sync functionality will play "traffic police" on managing what has changed and when.



Scenarios are another way that InfraWorks 360 allows you to share your model. With a scenario, you carve out a piece of your model and publish it for web or mobile viewing. Once this is done, anyone with a web browser or the free mobile app can view the scenario – InfraWorks 360 is not required.



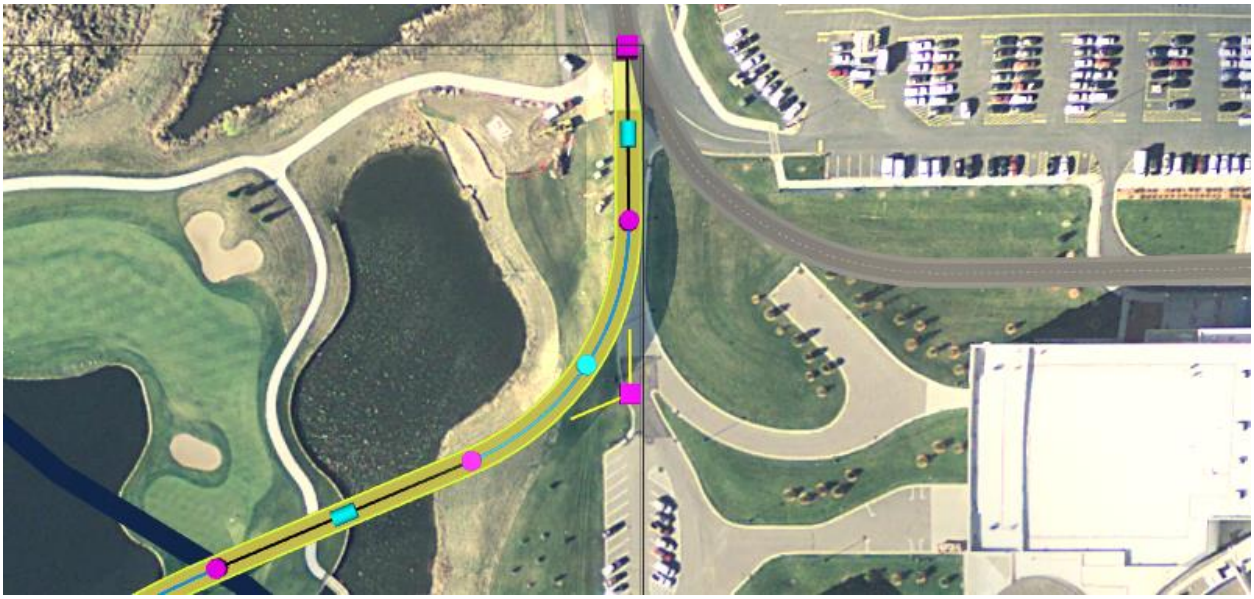
With the mobile app, you can even employ augmented reality to visualize your design in the field. Take your tablet out to the future site of your project, hold it up in your line of sight of the project, and you'll see your design superimposed over the existing landscape. How cool is that?!

Vertical Applications

With InfraWorks 360 LT, you cannot "plug in" the vertical applications of Roadway Design for InfraWorks 360, Bridge Design for InfraWorks 360, and Drainage Design for InfraWorks 360. The following is an overview of each vertical application.

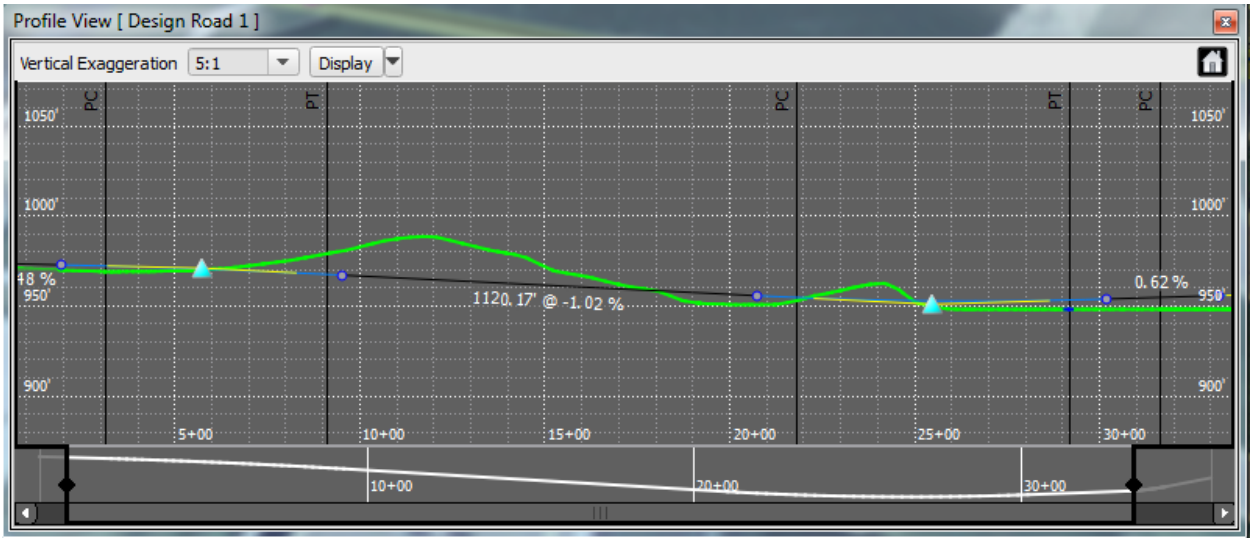
Roadway Design for InfraWorks 360

Roadway Design for InfraWorks 360 is one of three vertical applications that can be entitled within InfraWorks 360. This module adds more advanced, engineering-based roadway design when compared to the InfraWorks core Roads tool. With Roadway Design for InfraWorks 360, you're dealing with *design roads* which use alignments and profiles rather than the mysterious, but easy-to-use spline-based *sketch roads* of InfraWorks core.



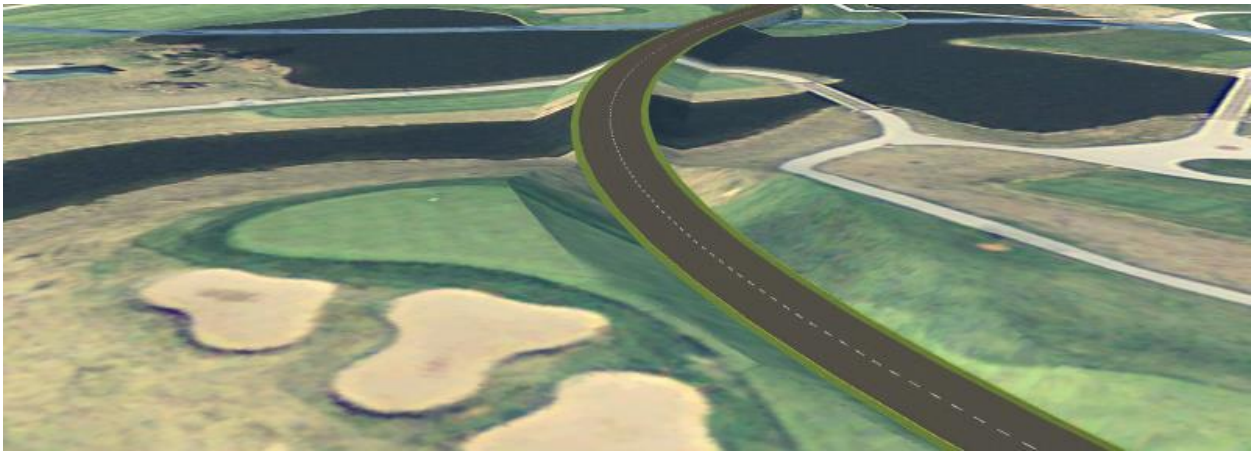
Something that Civil 3D can't even do, InfraWorks has gizmos (same idea as AutoCAD grips) located right on the road model, for both horizontal and vertical editing. When you change your view from top-down to more of an inclined view, the gizmos transform automatically and become PVI and vertical curve editing tools.

And if you're more of a traditionalist, you can also view your road design in profile view and make edits there too.



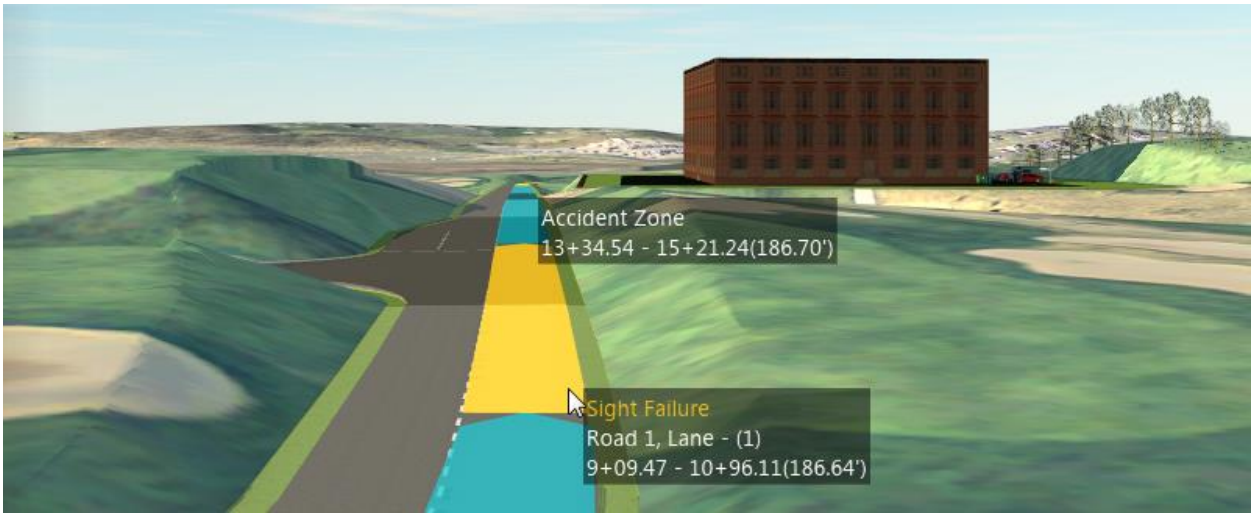
Design roads have zones that let you change up the number of lanes and the style.

Another capability of design roads is that the tie-in slopes can be built according to a constant slope rather than a constant offset (that's what sketch roads to). This is much more representative of how roads are truly built.



Roadway Design for InfraWorks 360 also lets you perform complex intersection design with more control over design geometry, ability to add turning lanes, and much more.

Roadway Design for InfraWorks 360 also has two powerful optimization and analysis tools. The first is Profile Optimization which will upload your current design to the cloud, optimize it based on cut and fill as well as other parameters you can define, and then send you back a better design which is more cost effective – basically it's doing your job for you! The second tool provides a very visual, "in-canvas" analysis of sight distance. This analysis can be performed on the open road…



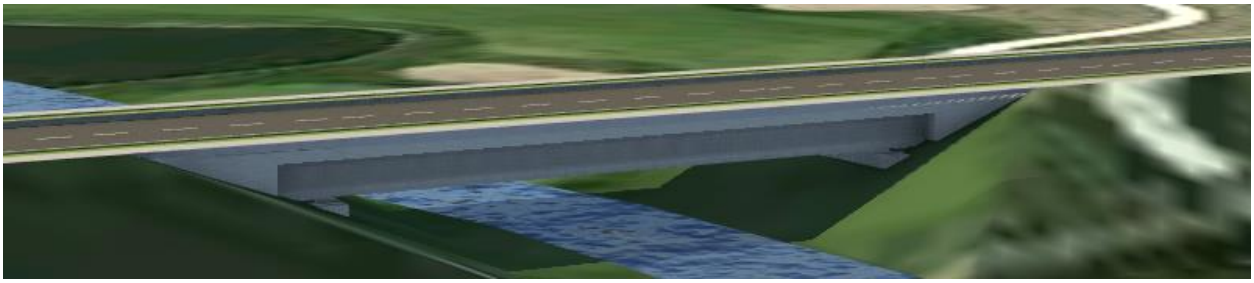
As well as for intersections.

Bridge Design for InfraWorks 360

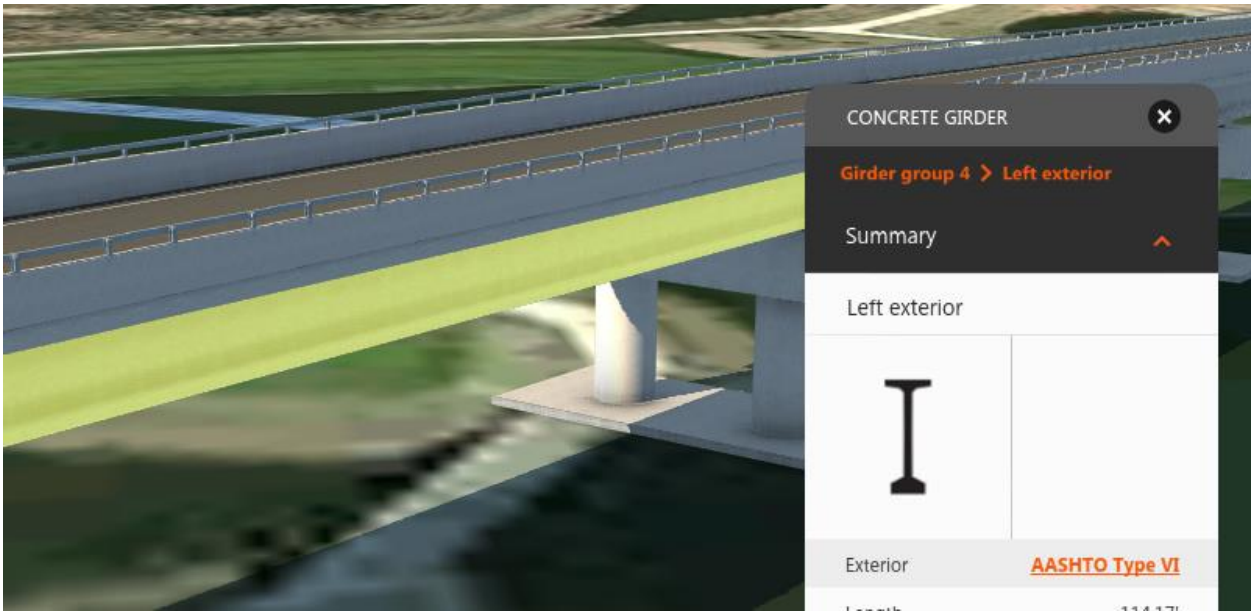
With basic InfraWorks you can make part of a road look like a bridge by applying a different style, but the bridge is really just a visual representation – there is no "thought" put into the structural design or configuration of the bridge. With Bridge Design for InfraWorks 360, engineering principles are applied to size and configure the major components such as the deck, superstructure (girders) and substructure (piers and abutments). The goal is not to fully design the bridge but to get a really good idea what is possible and what the sizes and spans of the major components will be. With this information, the feasibility of a bridge can be assessed very early in the project so that important decisions can be made.

When Bridge Design for InfraWorks 360 is entitled, it actually runs itself. If you create a design road over a body of water or over a ravine with a depth beyond a certain tolerance, a bridge will be created automatically.

Of course you can manually create bridges as well. To create a bridge you simple click one of the bridge tools (precast I or steel plate) and pick two points on a design road. The software will analyze the span and automatically assign the sizes and configuration for the girders and piers based on the span, width of the road, and other factors.

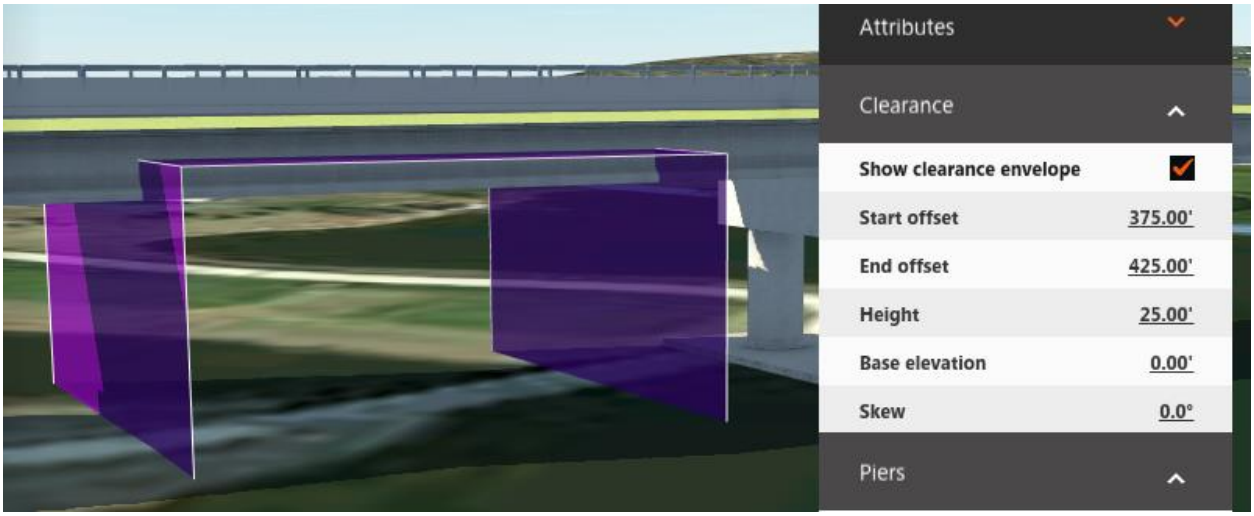


You could call it done right there or you could spend some time modifying the bridge in a number of ways. You can access different components of the bridge by first clicking the bridge, then clicking a component a second, or even third time. For example, to change an individual girder you would click anywhere on the bridge, then click the girder once to select its group, then click it again to select the individual girder. Now you can swap out the girder for another in the catalog or make other changes.

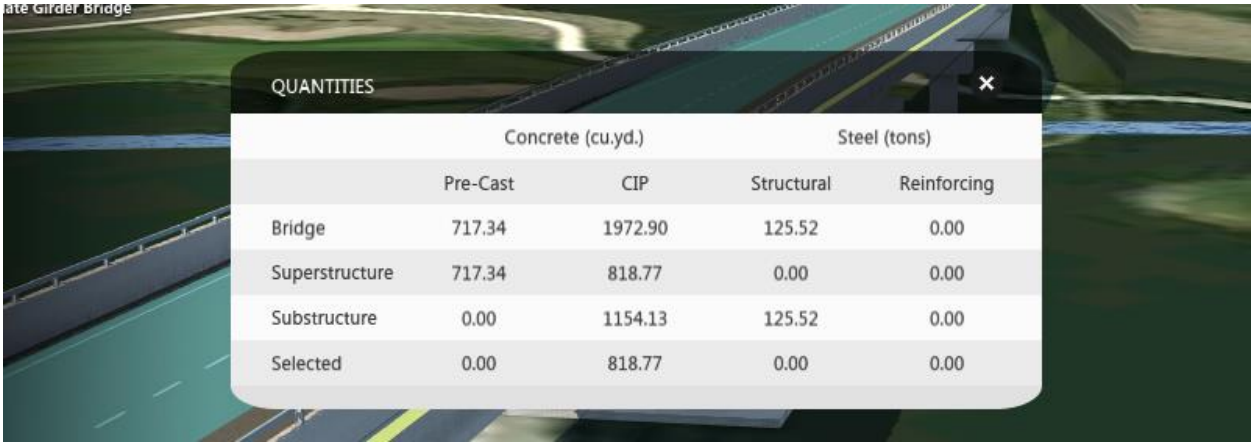


The same is true for piers, abutments, and even the piles underground. You can move, rotate, and even delete piers, you can change the configuration of the pier foundation, and you can even rotate and move abutments.

Another helpful tool is the clearance envelope which allows you to define the extents of an object that needs to pass under the bridge, and then assess or even make adjustments based on clearance.



At any time you can get an idea of the construction cost of a bridge by right-clicking it and selecting Quantities.



Drainage Design for InfraWorks 360

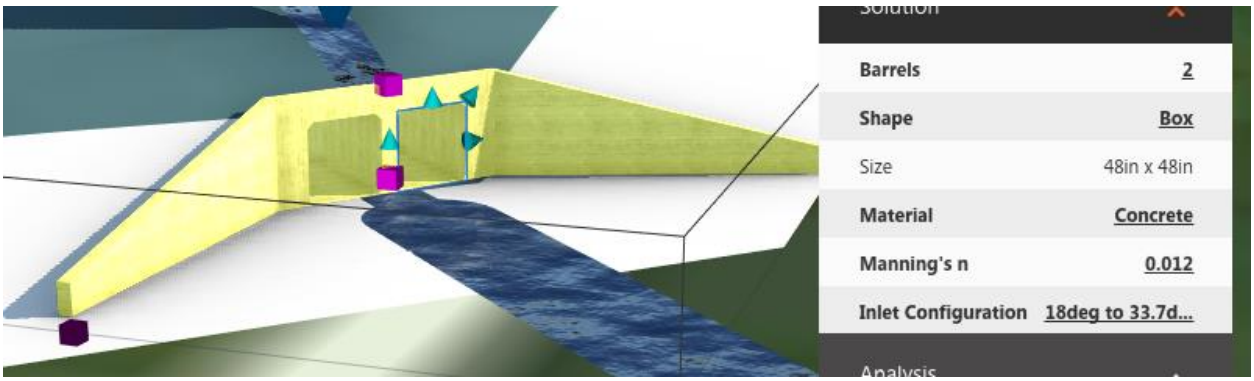
Hydrology and hydraulics are of course a major consideration with any infrastructure or land development project. With Drainage Design for InfraWorks 360 you can benefit from the same rapid, visual, engineering-based design that you've seen with the roadway and bridge vertical applications.

One aspect of Drainage Design for InfraWorks 360 is the ability to analyze and generate watersheds based on your terrain and design roads. This is a fairly intense calculation so your software will harness the power of the cloud to make it happen. To delineate some watersheds, launch the Create Watersheds tool and pick a point or a design road. You can analyze the entire road or a station range that you specify. You'll need to address some basic settings regarding the accuracy of the analysis but then you're ready to submit your request to the cloud and wait for the results to appear. Oh, and be advised that you may need to spend some cloud credits.

Once you've got watersheds in your model you can go to the next step and provide design flows or even have InfraWorks 360 calculate them for you.

Culverts are another major feature of Drainage Design for InfraWorks 360. As with the other features we've studied, the culvert functionality is intended to be fast, visual, and engineering-based. Once you delineated some watersheds (which also come with streams, by the way), you can right-click a design road and InfraWorks 360 will automatically create culverts where the streams cross beneath the road. And, if flows have been provided for the watersheds, the software will even automatically size the culverts. This is a great way to assess whether a bridge or a culvert is the right solution for a given crossing. InfraWorks 360 even provides an in-canvas visual analysis of the culvert that you can view at any time.

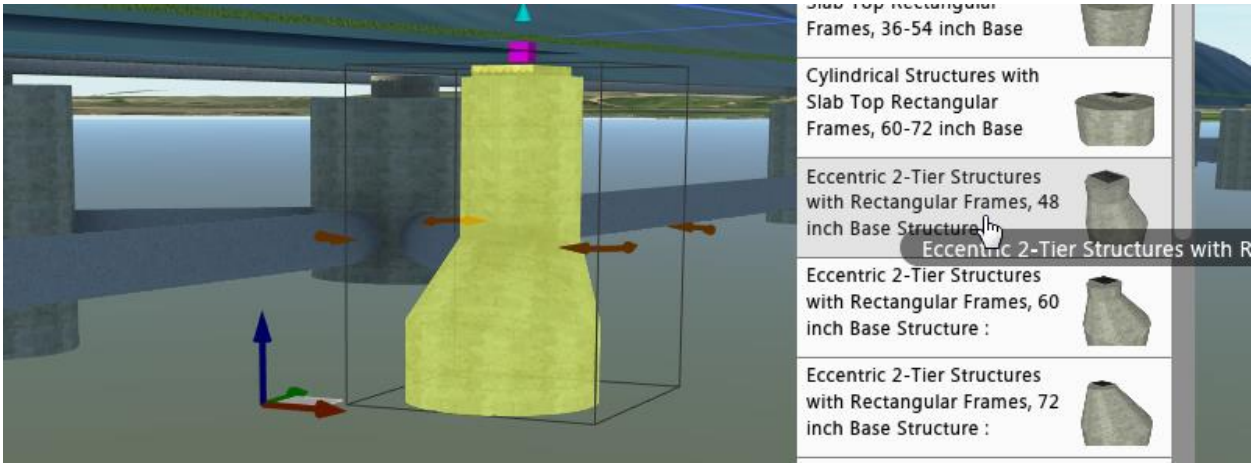
Of course you can manually create culverts and modify many aspects of their design including the layout as well as the shape, size, number of barrels, inlet configuration, and more.



Pavement drainage is another feature set of Drainage Design for InfraWorks 360. You can create a system of inlets, pipes, and manholes for an entire design road or you can create the components individually using the tools on the drainage design toolbar.

Or, you can do a combination of the two: let InfraWorks 360 lay out your drainage system automatically and then make changes, delete components, and add components to get the result you need.

When this feature first came out, the choices for inlets and manholes were very limited, but with recent updates to the software, there is now an extensive library to choose from.



Preview Features

Another benefit of InfraWorks 360 is that you get access to preview features – parts of the program that Autodesk is working on but haven't been officially released for production. You can simply turn these features on from InfraWorks 360 Home, agree to the terms and conditions, and then they will become functional within the software.

Conclusion

InfraWorks 360 LT is a great program that can really get you started with aggregating existing conditions data and sketching your design to get your ideas across. Then when you add the functionality of InfraWorks 360 and its vertical applications, you now have a powerful, visual, preliminary engineering tool that has all the speed and visual impact of InfraWorks 360 LT with the real, practical principles used to design the most important parts of every land development and infrastructure project: roads, bridges, and drainage/hydrology. With this tool you can visualize and present designs that are practical, feasible, and constructible in a stunning visual environment that leaves little to nothing to the imagination. In addition, you get the capability to use Model Builder to hit the ground running in 10 minutes or less along with the ability to share and collaborate, removing geographic boundaries and enabling a team of any size or any geographic distribution to achieve design goals. Simply put, if you've used InfraWorks 360 LT and you're impressed, you'll be blown away by the full package of InfraWorks 360 and all its vertical applications.