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# AUGIWorld

The Official Publication of the AUGI Design Community

July 2019

# Assistance from Third- Party Apps

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# Letter from the President



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## GREETINGS!

**T**o my friends in the USA, Happy Independence Day! We look forward to picnics and fireworks celebrating our independence as a nation.

Independence is often seen as an important quality. We teach our kids to be grown, independent adults. My youngest is now 15, and let me tell you, that is no small feat! I hope that someday my children will thank me for raising them to cope in this crazy world of ours. We have tried to allow them to make their own life decisions (within reason!) and also to face the consequences of those decisions. However, we never truly allowed them to go it alone. Sometimes, we just have to have a partner to lean on.

So it goes with this issue of *AUGIWorld*—our third-party application issue. While our focus has mainly been Autodesk products, we recognize that sometimes we just can't go it alone! There are developers out there who recognize that sometimes our software or our processes just need a little something. Third-party add-ins to software are like the icing on the cake! They make our jobs just a little sweeter.

Kudos to our authors this month. It's often a thankless job, but we appreciate everyone's contributions. We here at AUGI are thankful for those who commit to writing each month, and we are always welcoming new authors. Each of our authors comes from their respective industries with knowledge obtained from working in the trenches, and we appreciate their willingness to share that knowledge with our members. If you have ideas for articles, please feel free to reach out to our content managers. You, too, can be an AUGI author!

It's hard to believe, but we are also gearing up for Autodesk University in Las Vegas in November. More details will follow in the coming months, but save the date (November 19-21) and start working on those travel plans. We hope to see you there!

Happy 4th of July!

Cheers!

Kimberly Fuhrman  
AUGI President

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AUGIWorld (San Francisco, Calif.)  
ISSN 2163-7547





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NEWSLETTER

# Extending the Functionality of Revit



**R**evit® is a great platform for the BIM process. It can model elements and systems, manage parametric information for those elements and systems, and make construction drawings from that model. But I've never heard anyone say that it does everything they want. There is always room for improvement, new features, and customization. This is where third-party tools and add-ins can help fill that void.

A specific third-party add-in I'd like to discuss in this article is RF Tools by RushForth Projects (<http://www.rushforthprojects.com/>). It contains lots of useful features for any Revit user but also several that will make an MEP consultant's life easier. For the price of the add-in you get a ton of functionality and responsive support. I won't be able to cover all the tools this add-in contains, but I will highlight some of my favorite features.

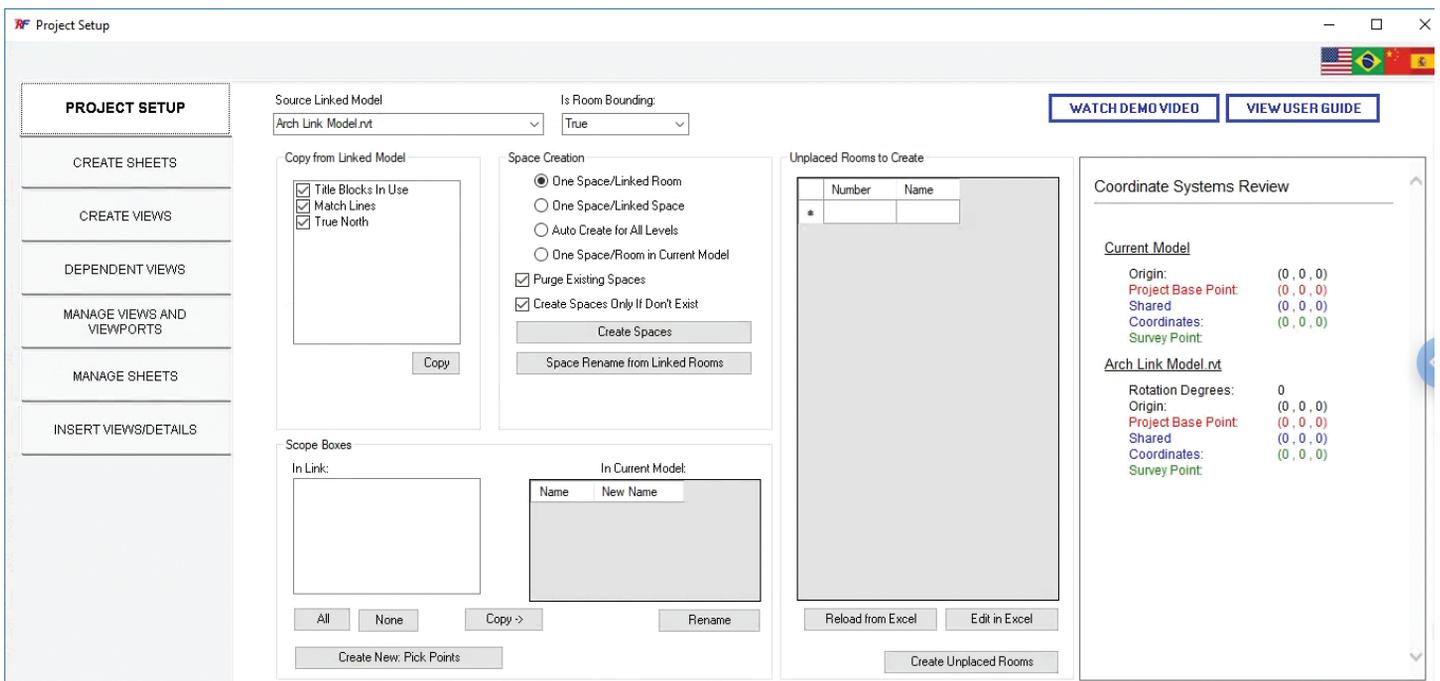


Figure 1

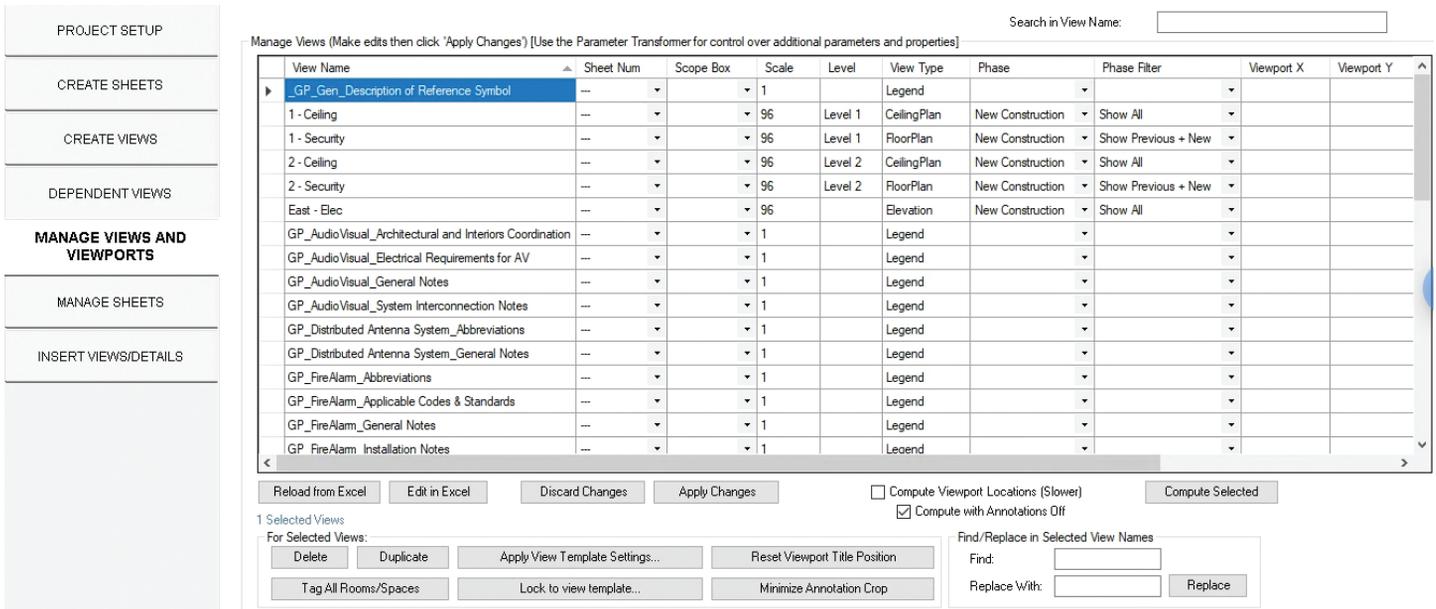


Figure 2

## PROJECT SETUP

RF Tools installs its own tab and ribbon. One of the first and most often used buttons is called Project Setup. From here you can access all kinds of functionality that assist not only in setting up projects, but also in managing critical project objects like views, sheets, scope boxes, rooms/spaces, and so on. Project Setup launches a dialog box that has tabs on the left, each performing several distinct functions (Figure 1).

Title blocks, matchlines, and scope boxes can be inserted into the host model from a linked model of your choice without even having to open the linked model. Similar to the space creation and naming tool finally built into Revit a couple releases ago, Project Setup does the same thing and then some, offering even greater flexibility and controls, including room creation.

The second tab in Project Setup is Create Sheets. Pretty straightforward and, as the name suggests, sheets can be created in bulk either as placeholders or with a specified title block. My personal favorite is that sheets from the linked model can be accessed, added to the dialog box, edited in Excel, and then re-imported for quick and easy sheet creation that matches the linked model standards.

Create Views, the next tab, allows for view creation based on levels in the model. But the real power of this tab, combined with the Create Sheets tab, is that an Excel template can be made of required views and sheets per level. This can be a big timesaver and standards enforcer for prime and consultant teams alike.

The Dependent Views tab aids in creating dependent views and improves on the built-in workflow. Dependent views can be made in bulk for selected parent views in two ways. One option is to do so by scope box, incorporating the name of the scope box into the view name. The second option is to make dependent views based

on views in the linked model. Again, all without having to leave the host model while ensuring matching the linked model.

The next two tabs, still in the Project Setup dialog, get used repeatedly throughout a project. Manage Views and Viewports and Manage Sheets offer functionality that is essential to Revit view and sheet management. You will wonder how you lived without it or why it isn't incorporated into Revit itself.

In the Manage Views and Viewports tab (Figure 2) you will notice lots of functionality to make your life easier: search/filter, find and replace, edit in Excel, duplicate (while renaming or adding prefix/suffix), apply view template, assign view template, reset view title, minimize annotation crop, and, another personal fav: tag all rooms/spaces in selected views.

This last one will tag all rooms or spaces in views of your choosing. Love it!

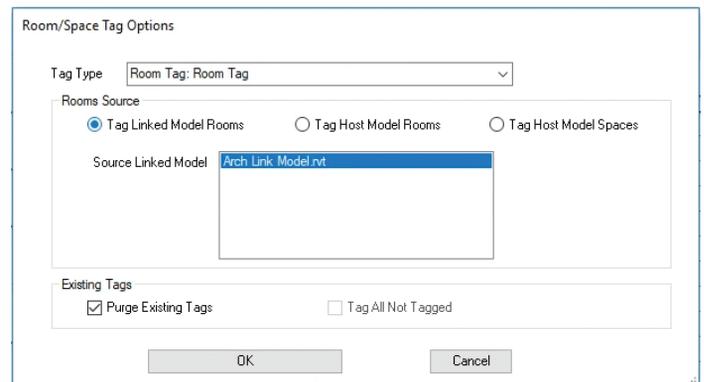


Figure 3

# Revit MEP

Furthermore, you can also automate the placement of views on sheets and by getting the locations of views placed on sheet, place similar views in the same locations across sheets.

Manage Sheets (Figure 4) is very similar with regard to sheet management and manipulation. From here, you can search/filter sheet names and numbers for easy selection, use find and replace on sheet names, edit in Excel for more involved editing, and apply revisions to sheets in bulk.

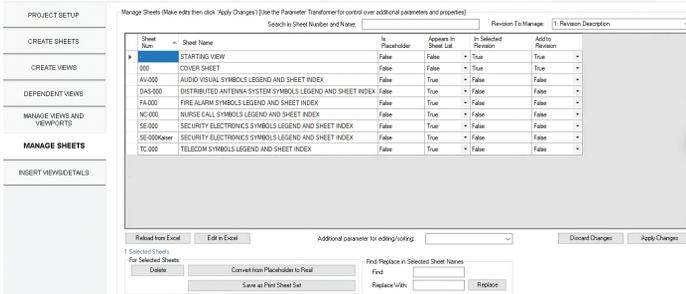


Figure 4

On a side note, it boggles my mind more that advanced view and sheet management tools are not included in Revit. Autodesk's two main pieces of software aimed at the AEC community, Revit and AutoCAD®, and neither one has built-in abilities to manage views and sheets in bulk. Any project that contains more than 10 sheets needs a way to bulk edit sheets and views—otherwise, you are wasting time. How many projects do you have that have more than 10 sheets? Exactly.

Last but not least in Project Setup is the Insert Views/Details tab (Figure 5), a fairly recent addition to RF Tools. Like the “Insert Views from File” functionality that is native to Revit, it allows drafting views to be inserted from a chosen file. However, search helps in finding views, and presets can also be saved to quickly insert often used views.

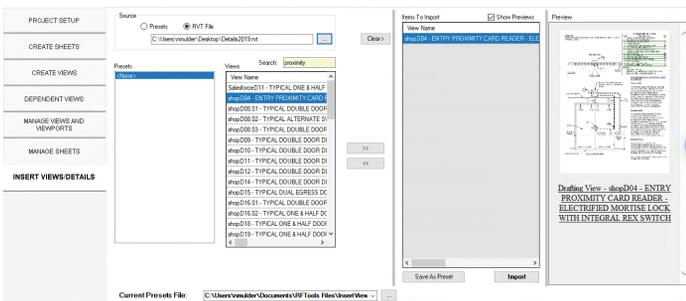


Figure 5

## PARAMETER TRANSFORMER

Next up is Parameter Transformer (Figure 6). From here, just about any parameter and any element can be accessed, selected, and filtered. This dialog box is made up of five tabs along the top left: Filter, Modify, Excel, Transform, and Purge Tools. Under filter, pre-made filters can be saved and reused.

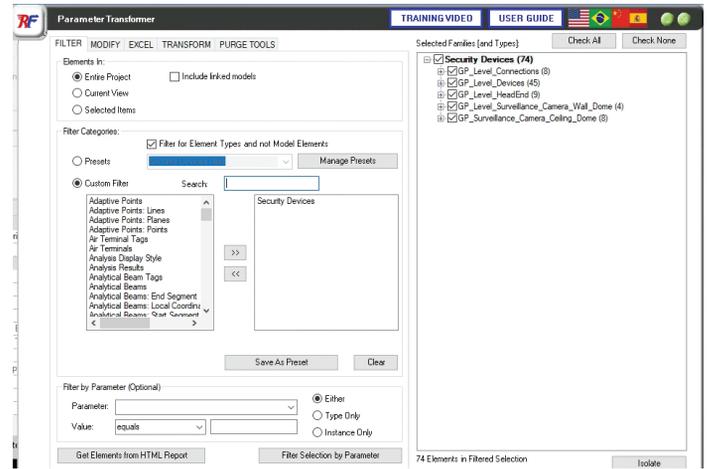


Figure 6

Once filtered and selected, elements and their parameters can be operated on in the Modify tab without even exporting to Excel first (Figure 7). Options include find and replace, copy from parameter, and sequentially number. The powerful thing about copy from parameter is that you can select room information from a linked model and copy that information to a parameter on the selected element(s). If numbering sequentially, a useful feature is that a parameter can be used as or before the prefix.

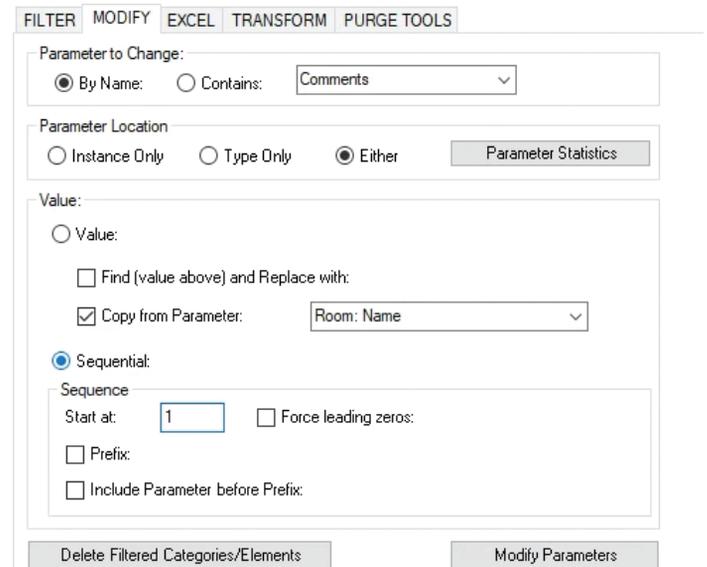


Figure 7

If more functionality is needed than what the Modify tab provides, the next Excel tab is where element and parameter information can be exported to Excel for manipulation and import. In addition to built-in, project, and shared parameters, even parameters available only to the Revit API can be accessed and selected. Additionally, selecting a Revit schedule will add the parameters in use in that schedule and can also be used as a “filter” of its own by only selecting elements in that Revit schedule (Figure 8).

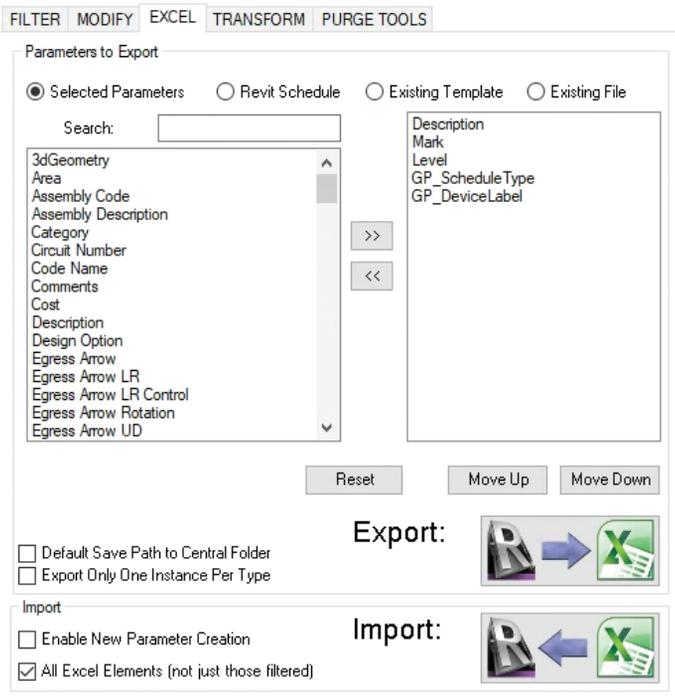


Figure 8

The Transform tab (Figure 9) allows for placement of elements based on location information of selected elements from the filter tab. I have used it to place hangers along cable tray at specified intervals. There are a lot of potential uses—all that is needed is your creativity!

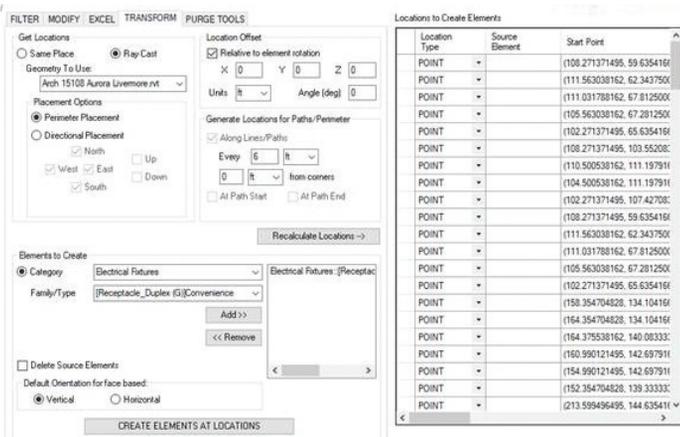


Figure 9

## PARAMETER LINKER

Project Setup and Parameter Transformer are great for parameter manipulation and one-time operations. But what if that one-time operation turns into a routine chore? Enter Parameter Linker (Figure 10)! This is another tool with lots of options and lots of potential. It allows you to not only copy parameter values from one element to another, but also establish a link so that if the source value changes so will the destination parameter value. Here are just a few possible workflows: 1) copy parameter values from source objects in linked

models to parameters in host model elements; 2) copy a parameter value not available for tagging (such as elevation/offset before Revit 2020) to a parameter that is on the same element; and 3) copy parameter values from model elements to elements in drafting views to help build and maintain information in risers and one-line diagrams.

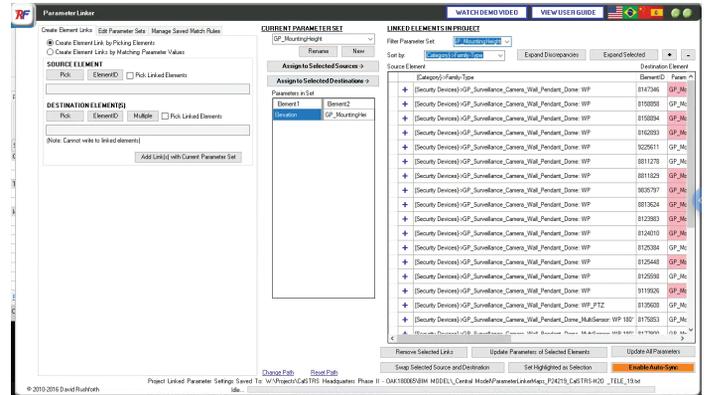


Figure 10

## PARAMETER SCHEDULER

In last month's article (AUGIWorld, June 2019), Dan Stine made the case for industry-standard shared parameters, which is a great goal. Until that day comes, Parameter Scheduler (Figure 11) can help wade through the drudgery of family content with mismatching parameters. With the Project Schedules Review, upon selecting a schedule in the project, it will tell you if some families having missing parameters and then allow you to add those parameters to those families without leaving the project or having to edit the family manually. You also have the ability to add shared parameters to a project in bulk as well as apply selected parameters to families in a folder. Very useful tools for managing parameters to maximize information tagging and scheduling.

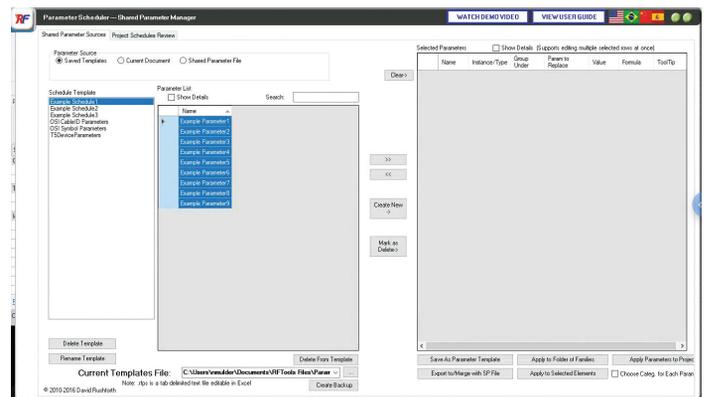


Figure 11

## ELEMENT TAGGER

Element Tagger allows you to tag any element in the model in multiple views at once. It also provides various controls for tag positioning and avoiding duplicate tags. This is simple but powerful functionality (Figure 12).

# Revit MEP

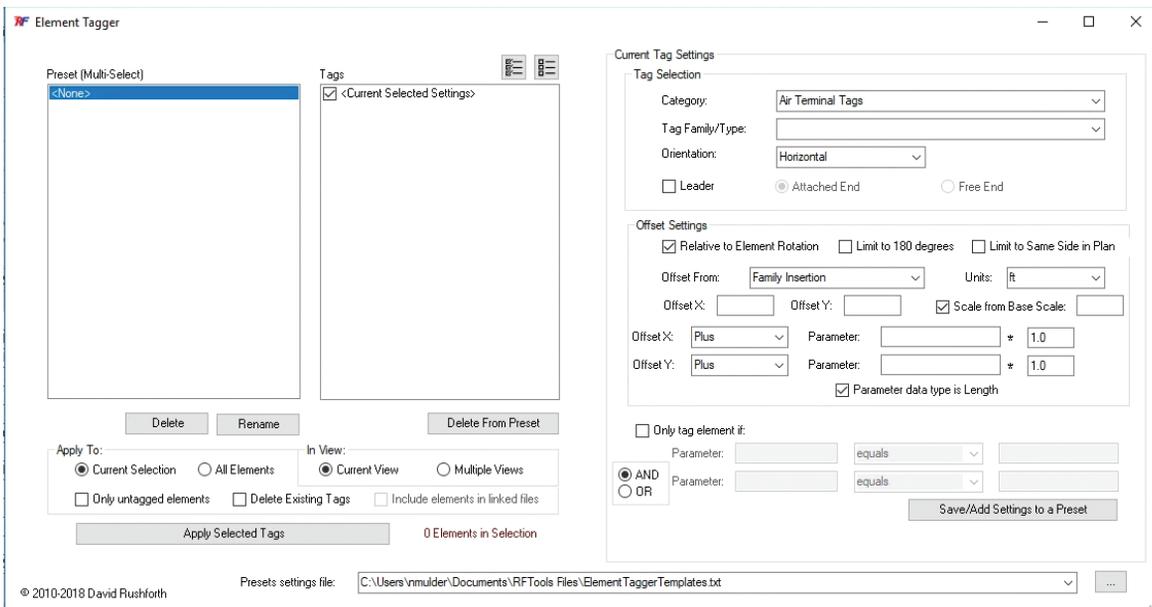


Figure 12

A few other honorable mentions are Open CAD link, 3D sections, and DraftXL. Open CAD link will automatically open the selected DWG link in AutoCAD without having to manually find the file in Windows or get the saved path from Manage Links. 3D Sections offers various helpful shortcuts for making 3D views in the model (Figure 13).

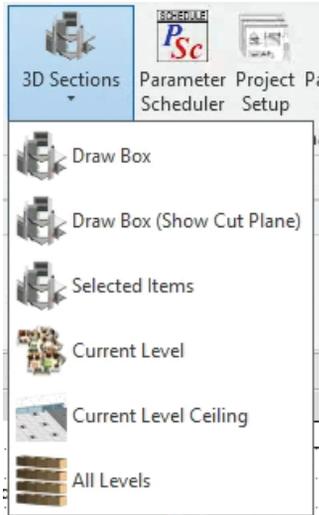


Figure 13

Lastly, DraftXL, as you might predict from the name, allows for importing Excel calculations into Revit. It converts the file/cell range to a drafting view, drawing lines for grids/borders, and text for the cell values. Obviously, scheduling elements in Revit is the preferred workflow, but this is a solution for tables not natively scheduled in Revit (Figure 14).

Add-ins extend the functionality of Revit. There is an active community of developers, many of whom make their tools available on the Autodesk Exchange app store (<https://apps.autodesk.com>).

Many add-ins are free and most are inexpensive. In most cases, the minimal purchase cost easily pays for itself in reduced or eliminated manual tasks. Consider all the things you regularly do in Revit. There is probably a third-party add-in to help you complete those tasks, saving you time and reducing errors.

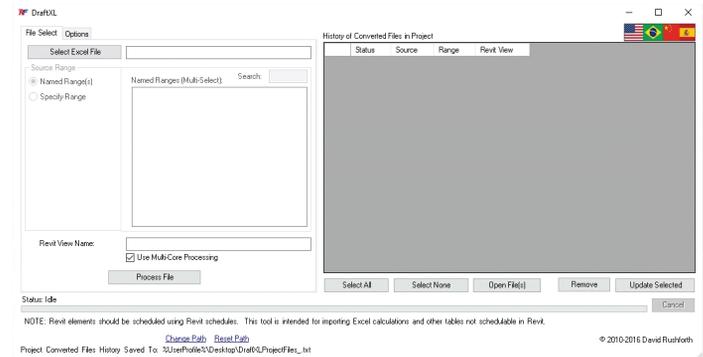


Figure 14



Nathan Mulder has more than 10 years of experience in the AEC industry. He is currently the BIM and CAD Manager for Guidepost Solutions, a global leader in investigations, compliance, and security consulting, offering design services for security, telecom, and technology systems. A Revit MEP Electrical Certified Professional, Nathan is always looking for ways to fully leverage software to improve the project design and management process. Contact him at [mulder.nathan@gmail.com](mailto:mulder.nathan@gmail.com) or on LinkedIn.



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# The eTransmit Add-In

**A**s a Structural Engineer, Designer, or BIM Technician, you have probably had to share Autodesk® Revit® files with your design team or anyone involved in the project along the way. Below I am going to outline one of my favorite Revit add-ins that will hopefully make your file sharing process a little bit easier. The eTransmit add-in has been around for a while now, but is very versatile and helpful.

Some common uses for eTransmit are:

- Internal archiving
- Sending deliverables to clients
- Model exchanges between consultants/partners
- Sharing models between disciplines
- Upgrading models

## WORK SMARTER, NOT HARDER

Some common issues that can occur when sending Revit files to clients are not including dependent files, which in some cases can render the file useless, and not detaching your intended file to be shared from the Central Model.

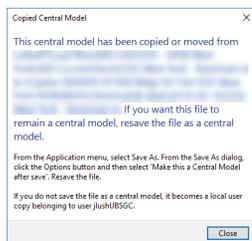


Figure 1: Central file error

eTransmit allows you to group all dependent files into a designated folder while detaching the model from central, which will eliminate the need for your file recipient to take some additional steps to use the files once received.

## WHAT'S UNDER THE HOOD?

Let's go through the options available in this tool (see Figure 2).

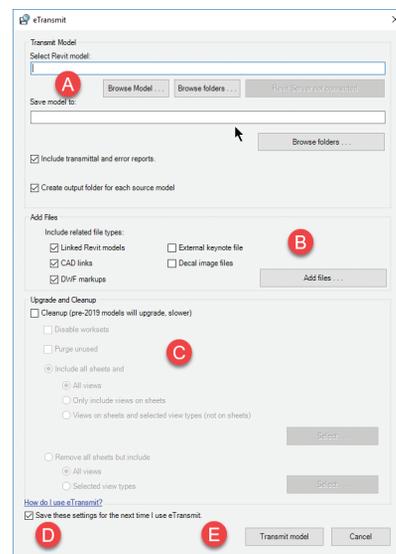


Figure 2: The eTransmit interface

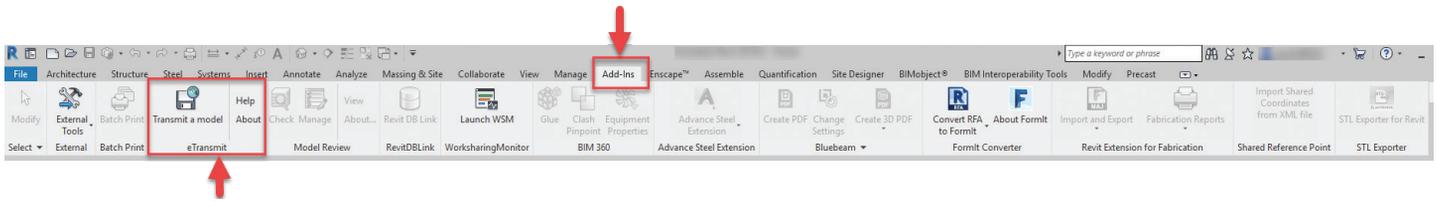


Figure 3: Locating eTransmit in Revit

- A. This area is where you will choose the model you want to transmit along with the location where you want to save the model. Here, you also have the option to create a transmittal and an error report and the option to create a separate folder for each source file.
  - B. The “Add Files” area is where you can find options on what files you want to include when you eTransmit a model. You can include items such as linked Revit models, CAD files, etc. that will be included in the folder you chose in Step A.
  - C. The upgrade and cleanup area of the interface allows you to purge unused items, disable worksets, and even eliminate all or certain sheets from your model as well as limit the views you include. This is a great area to control the content and the file size of the model.
  - D. Once you set the options you prefer in areas A through C, you can choose to save the settings for the next time you use eTransmit. This can be a nice timesaver when you are sharing models through the lifetime of the project on a regular basis.
  - E. Now just hit the Transmit Model button and let eTransmit work its magic. The only thing left to do is share your document through your preferred method (Newforma, Dropbox, etc.).
2. Select the model(s), a target directory, and file types to transmit.
  3. Optional: Select to open and save models in the active version of Revit (upgrade).
  4. Optional: If upgrading, select to purge unused families and other Revit objects.
  5. eTransmit for Autodesk Revit inspects the model, repaths and saves all linked files and external files in the target directory. If the options were selected, the files are also upgraded, and unused objects are purged before the files are saved to the target directory.
  6. Optional: Open the transmitted model in the target directory to validate transmission.
  7. Send the model by email, FTP, or another method.
  8. The recipient opens the transmitted model.
  9. For a workshared model, the recipient selects an option in the Transmitted model dialog.

## IN CLOSING

Even though the eTransmit add-in has been around for a while, it can be a very useful workhorse when it comes to sharing Revit models.

In my opinion, the ability to automate some of the needed and recommended steps when it comes to sharing Revit models is huge. Not only does using this tool save you time, but it also adds a level of consistency to your processes leading to a more successful project.

In an industry that relies heavily on relationships, trust, and competency, file sharing is so important! The next time you come across the need to share a model with a client, give the eTransmit add-in a try.

## WHERE TO GO

Now that you know of all the wonderful things this tool can do, you are probably wondering where in Revit you will need to go to locate the eTransmit add-in. Click on your Add-ins tab within Revit; eTransmit has its own panel. See Figure 3 for a visual aid on where to go.

## FOLLOW THIS WORKFLOW

We hit on some of this already, but it can't hurt to review the workflow to follow when using this tool. As with most tools, there is a preferred method of use to follow. Follow this workflow to package a Revit model for transmission and you will be successful.

1. **\*Ensure that all models are closed\***. On the eTransmit panel of the Add-Ins tab, click Transmit a Model. This is the most important step to follow.



Jason Lush is a BIM Technician with the VDC Group at Kinsley Construction in York, Pennsylvania. Jason is also the Revit Structure Content Editor for AUGIWorld. He can be reached at [jlush@kinsleyconstruction.com](mailto:jlush@kinsleyconstruction.com).

# Third-Party Help for 3ds Max

There are some incredibly powerful add-ons for 3ds Max®. These include Redshift, Vray, integration with programs such as Substance and Keyshot, and many more—produced by professional software companies. Often though, some powerful tools to help us with our daily production come from independent artists and smaller teams focused on sharing the tools they've made to make work easier, simply so that our work and lives can be easier as well. This article will focus on a few of those.

**PAUL NEALE**  
**3D TECHNICAL DIRECTOR AND**  
**TRAINER**

Paul Neale has worked within the animation industry for several years. He creates tutorials, speaks at public events, writes scripts, builds custom Creation Graphs, and more. Today, his site includes several scripts, but I'd like to focus on the Max Creation Graph he shares called Clone on Spline. Clone on Spline allows users to array an object along a spline while simultaneously draping that object onto a surface (see Figure 1). If either the spline or surface adjusts, the objects are updated dynamically. This is incredibly powerful for fencing, rails, barriers, paths and trails, and many more applications.

In addition to the MCG, Paul offers several free scripts for download, including the following.

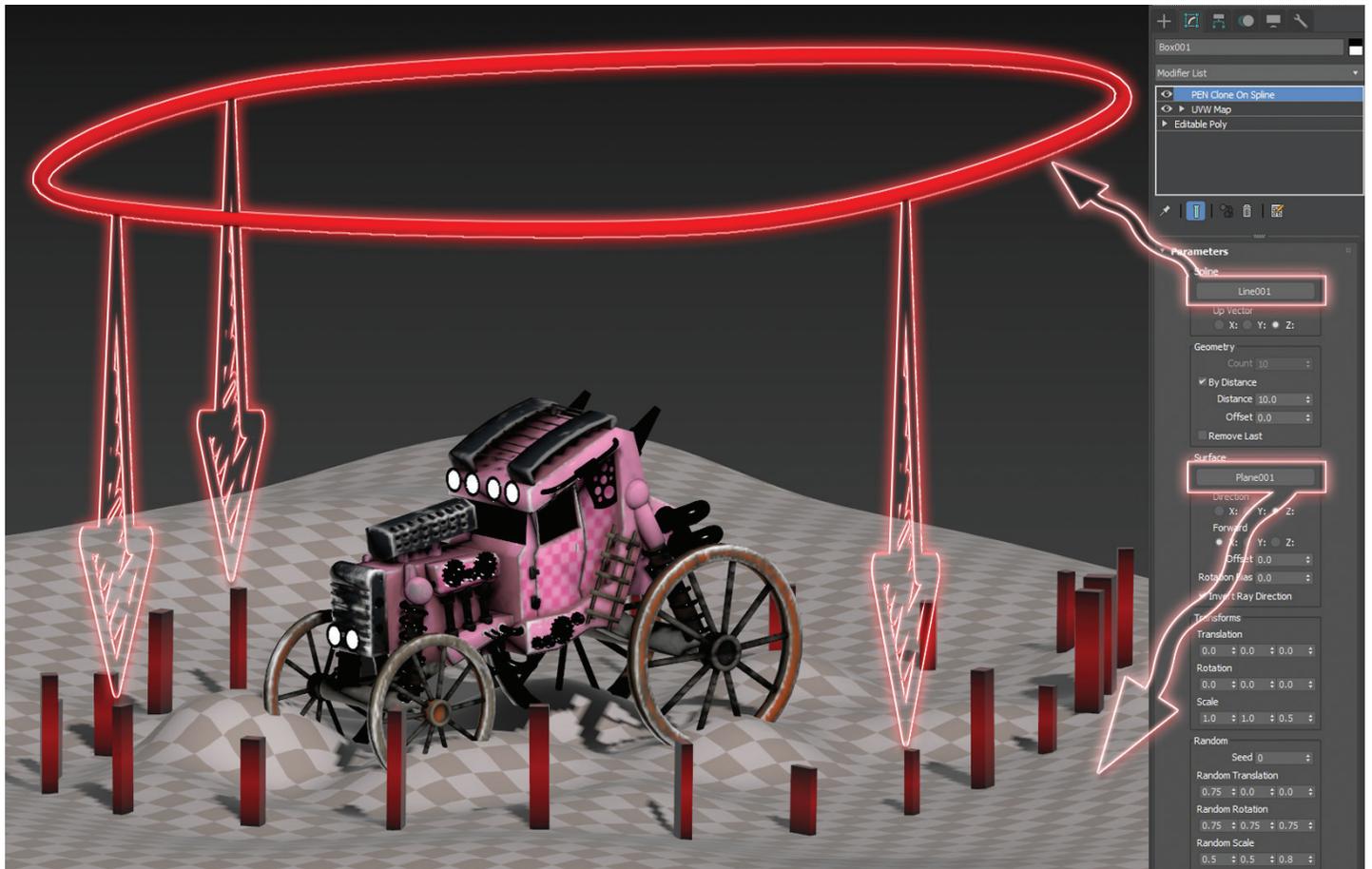


Figure 1: Paul Neale's Clone on Spline Max Creation Graph

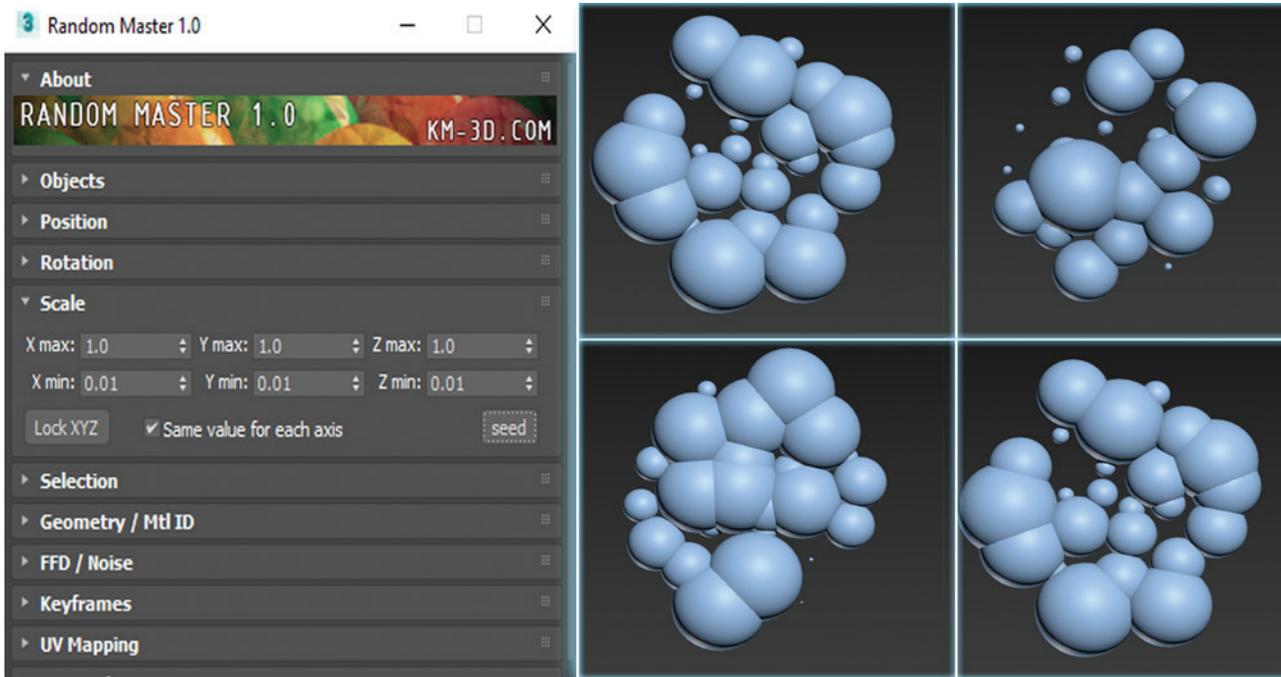


Figure 2: KM-3D Random Master Version 1.0

- ✦ A Track Editor
- ✦ Pose Saver
- ✦ Pen Attribute Holder
- ✦ Auto Material
- ✦ Batch It Max
- ✦ Control Objects
- ✦ Find Modifier
- ✦ Pen Helper
- ✦ Math Functions
- ✦ "M" Group
- ✦ Mirror Objects, and several more

## KM-3D

KM-3D is created by programmer and 3D technical artist Kamil Małagowski. His website, KM-3D.com, is packed full of powerful tools for 3ds Max. The site includes scripts, plug-ins, free stuff, and more. Free scripts include:

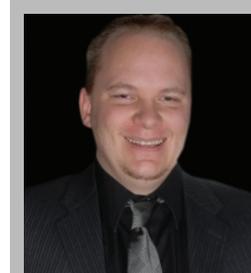
- ✦ An Angle Loop
- ✦ Autostretch (based on motion)
- ✦ DeltaMush to Skin
- ✦ Printer Script
- ✦ Smooth Boolean
- ✦ Spline Scatter

Kamil's product, Random Master, has been particularly useful as it combines everything necessary for randomization in one spot (see Figure 2).

Random Master allows you to randomize:

- ✦ Position
- ✦ Rotation
- ✦ Scale
- ✦ Material maps
- ✦ UVW Mapping gizmo
- ✦ Keyframes
- ✦ FFD modifier points
- ✦ Noise
- ✦ Selection of objects
- ✦ Selection of faces/vertices/edges
- ✦ Material ID

It has a wide range of capability and is useful for an enormous number of applications.



*Brian Chapman is an Autodesk Authorized Developer, creator of Pro-Cad.Net and a Senior Designer for an engineering firm located in Las Vegas, Nevada. Brian can be reached at [procadman@pro-cad.net](mailto:procadman@pro-cad.net).*

# Productivity Apps for Civil 3D



“Time is money”—something you hear in most construction and design companies. The ability to cut down on time, but still be accurate and efficient is key to being more profitable. When designing in AutoCAD® Civil 3D®, being productive, fast, and efficient is key, and with the Red Transit apps and suite, you can achieve that. In this article I will share a few of the productive apps that I use from the Red Transit Pipe Network Productivity Suite.

## PIPE NETWORK PRODUCTIVITY SUITE

Red Transit apps have been around since 2011. I personally started using a few of the apps in 2012. Great apps such as the Slope Across Pipes help cut down on my utility design time drastically.

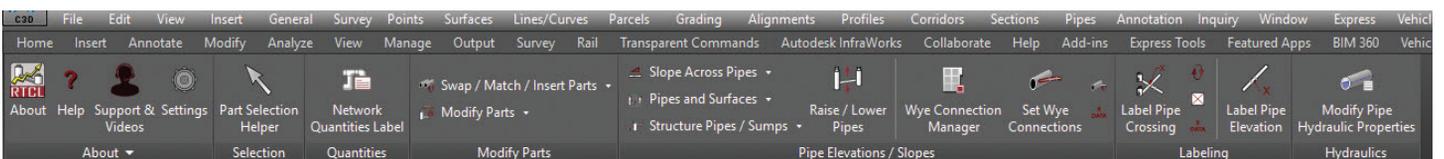


Figure 1

RedTransit Pipe Network Productivity Suite contains a large set of time-saving tools to cut down on repetitive tasks when working with AutoCAD Civil 3D gravity pipe networks (Figure 1). Cutting down on repetitive tasks such as swapping multiple pipe network parts or assigning a constant slope across multiple pipes helps increase productive time.

With the RedTransit collection, designers can increase productivity in task such as swapping parts, adjusting pipe elevations, adding wye connections, modifying part references, modifying part descriptions, modifying part style/materials, labeling pipe crossing, labeling pipe elevations at any point along pipe, renaming parts, gathering quantities, daylighting pipe at surface, and modifying hydraulic properties.

Many of these easy-to-use tools also provide selection capabilities from plan and profile views. Any experienced user who works with pipe networks will immediately recognize the benefits these tools provide. In the next few sections I will discuss a few of the apps you can find within the Pipe Network Productivity Suite.

## SLOPE ACROSS PIPES

Most designers who work on utility design projects such as storm and sanitary sewer understand the tedious task of changing multiple pipes across a section of pipes or a whole pipe network system. Though having a set of pipe rules is helpful, it is still limited to what it can do. Right now, the current workflow requires designers to edit pipe elevations/slopes individually by clicking each pipe, editing the properties, and entering in the elevation/slope information. The process is not natural and can be time consuming depending on the size of the project. In order to be efficient, elevations and slopes must be known in advance. But the design process does not work that way. Often, we adjust pipe elevations multiple times to help find the best design with a number of parameters, pipe slopes, elevations that must be held, depth of pipes, pipe conflicts, and so on.

If you purchase the Slope Across Pipes App, this tool allows for editing pipe elevations in a more natural way by selecting an upstream object and a downstream object, and the tool will apply the elevations/slopes to all pipes in between in just a few seconds with some guided input. Adjustment options allow for adjusting by slope or adjusting by holding two elevations and calculating the slope.

A recent update now also allows for assigning specific Pipe Slopes to pipes and specific drop elevations to structures. For a pipe or a structure with specific assigned information, while running this command it will observe and follow those settings for the pipe or structure regardless of what was entered in at the command prompt. This allows for maintaining specific design requirements on certain locations of your project and not having to re-enter that information

## WYE CONNECTIONS

For some regions in the United States, wye connections parts are common to connect lateral lines to main systems lines such

as for sanitary sewer and stormwater. Currently, Civil 3D has no way of creating an accurate wye connections part without a little manual calculation. It requires placing a pipe at the wye location and manually changing the centerline elevation invert value. This is done as one would expect—measuring the distance from one end of the pipe to the wye location, then multiplying that value by the slope of the pipe and adding/subtracting to the pipe end the elevation the measurement came from. From that elevation, a designer can establish the desired elevation of the wye connection.

The Wye Connection tool allows the designer to set a wye pipe elevation by first clicking on the main line pipe and then selecting the wye pipe. The tool automatically determines which end of the wye is closest to the main line to use for calculations, then does the math to calculate the elevation at that specific point along the main line pipe. Next, it prompts the user for any additive factors to the wye connection, and lastly adds XDATA to the wye pipe to allow for updating at a later time. Should the main pipe elevation/slope change, hit the wye update button and the calculations will be performed once again to update the wye pipe.



Figure 2

A recent update now also allows for assigning the Wye pipe slopes at the time of assigning the wye connection as well as implementing this on the automatic update side so that if a wye elevation changes, the defined slope will also stay the same. The update also includes a wye connection manager to easily find and modify your wye connection information from a tabular editor view.

## DAYLIGHT PIPE TO SURFACE

Civil 3D does not have a simplified way of determining pipe daylight out of a surface, though there are ways to calculate it using the software. If a designer has a pipe at 1.00 percent slope and they need to determine the daylight point and elevation on an existing surface, the only accurate method to calculate that is to draw a feature line along the pipe invert, extend longer than necessary, and then use grading groups to grade to the surface at any grade. The point between cut/fill on the grading is where the pipe daylight the surface.

The Daylight Pipe At Surface tool simplifies the entire process, prompting for the end of the pipe to extend by and selecting

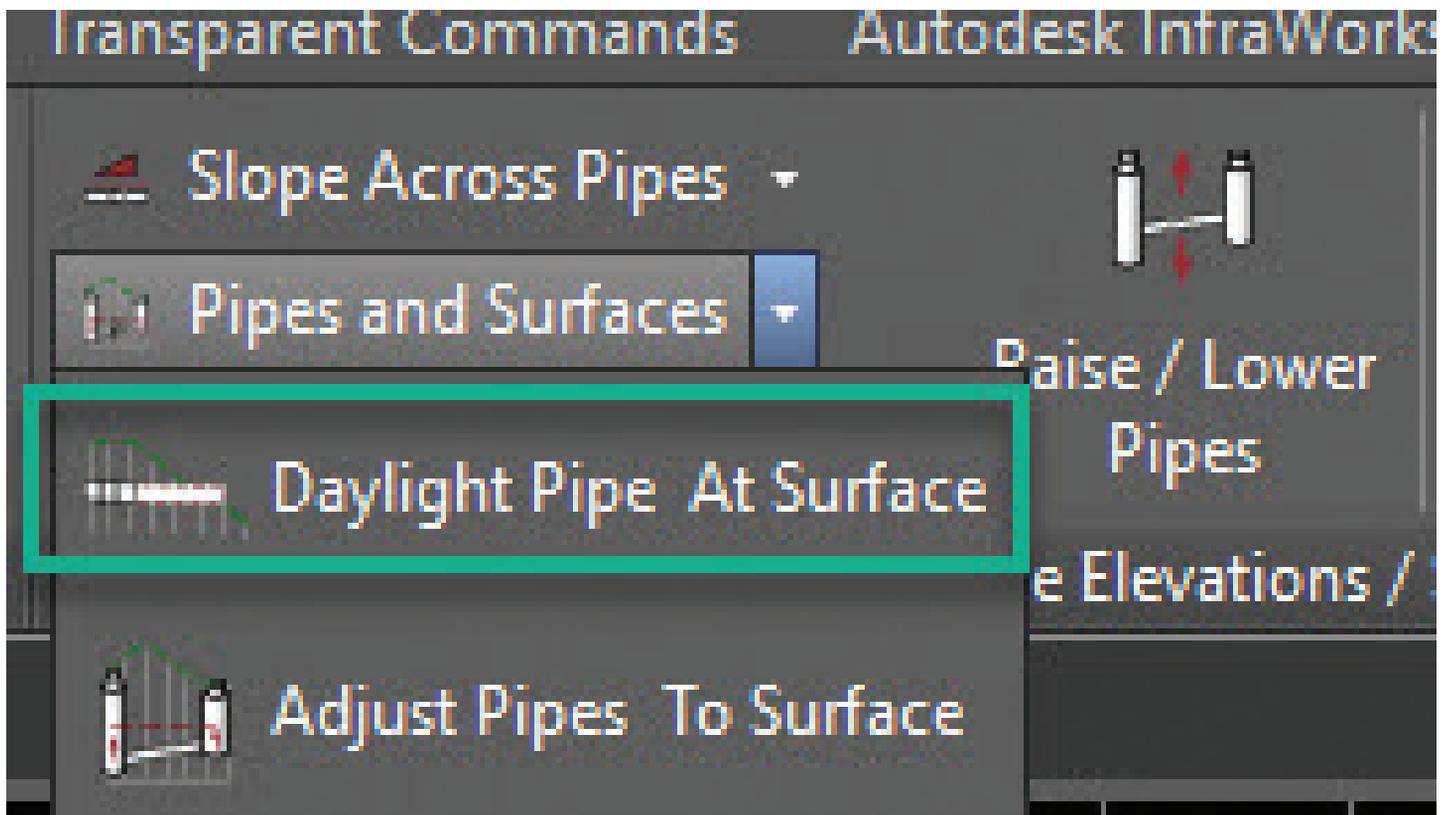


Figure 3

the surface to daylight to. The tool will then use the pipe's elevations/slopes to determine a daylight point/elevation and apply it to the pipe. This is just another helpful tool for utility design.

## SPLIT PIPE IN PROFILE VIEW

Another productive tool that comes within the Pipe Network Productivity Suite is the Split Pipe in Profile View. With Civil 3D, inserting a structure in the middle of a pipe can only be done from Plan View. Thus, if a user wants to insert a structure at a known location in profile view, they must do the following:

- ✦ Get the station from the profile view where they want the structure located.
- ✦ Zoom to the corresponding location in plan view.
- ✦ Note the station they want to do the insertion and the pipe.
- ✦ Edit the pipe network and choose the structure type to insert
- ✦ Insert a structure along the pipe, making sure the pipe break symbol appears, and choose the location.

With this tool, users can select the pipe to break, pick a location or enter a station in profile view, and choose a neighboring structure to inherit part type (or choose from a dialog) and the pipe is split into two parts with a new structure in between. No need to go back and forth between plan and profile with this tool—it maintains the alignment of the pipe and provides a warning if the pipe is not parallel to the source alignment of the profile view. This is a great app that I love using during my storm design.

In conclusion, using RedTransit Pipe Network Productivity suite for AutoCAD Civil 3D is a great way to be more productive and efficient when working with gravity pipe networks. You can find Red Transit apps within the Autodesk App Store or go to the Red Transit Consultants website at: [www.redtransitconsultant.com](http://www.redtransitconsultant.com).



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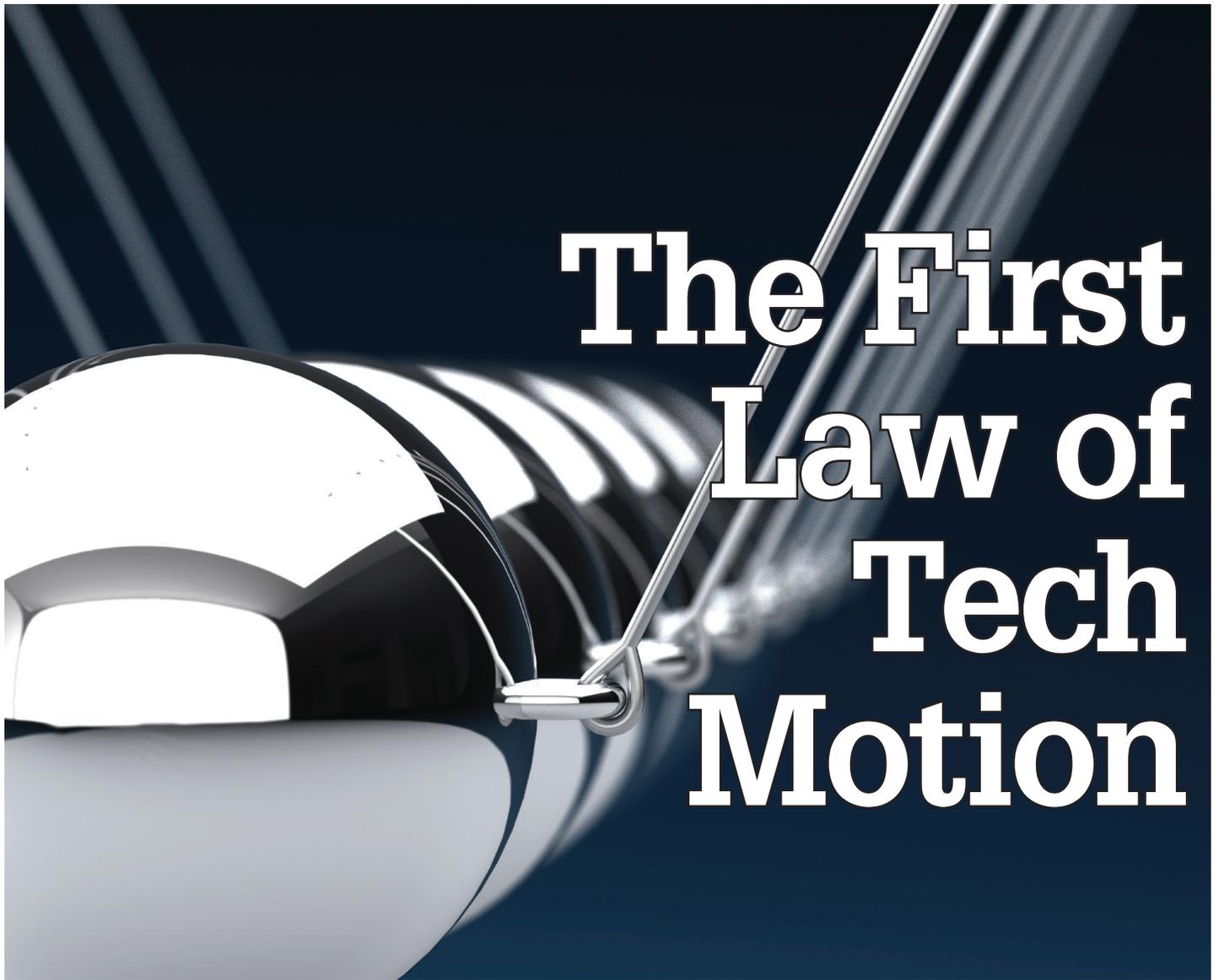
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# The First Law of Tech Motion



I love change! I imagine most of you actually like change, too. Everyone likes good changes. When things change for the better, everyone is pleased. Ask exactly what makes a change “better” and you might get several differing responses. We all like some things and not others. No one likes a change (or turn) for the worse. We want to avoid those.

Tech managers who oversee CAD, BIM, and other tech tools have to keep things moving forward. New releases, new software, new hardware, new methods, and new staff are always impacting our productivity. We need change, and change involves movement. We are tasked with getting things moving and keeping them moving. Change requires motion. Motion takes effort.

The Greek philosopher, Heraclitus of Ephesus (c. 535 BC – 475 BC), has been quoted as saying “Change is the only constant in life.” Don’t we all say this now? In the tech business, change is always happening. Sometimes slow, sometimes fast, and even sometimes in leaps and bounds.

Sir Isaac Newton’s First Law of Motion states, “A body at rest will remain at rest, and a body in motion will remain in motion unless it is acted upon by an external force.” Just so you are informed for your next get together... The second is, “The force acting on an object is equal to the mass of that object times its acceleration.” And the third is, “For every action, there is an equal and opposite reaction.”

The First Law is my focus, swapping change for the word motion—things don’t change much (unless you make them) and once change starts, it just keeps on going (unless you stop it).

## A BODY AT REST

We tend to rest in our design tool methods and get stuck in a rut. We use methods from prior releases that are still functional, but may not be the best. I bet you are still doing some things that you learned in the earliest release of the software you use every day. You still may have some command line tools in Windows. Some

early release processes from AutoCAD® 14 (well, maybe not that far back). Some self-created LISP routines that still work and you still use. Some first-generation BIM families that have not been updated because they still do the job. Nothing necessarily wrong with all of that, but it shows that you tend to stay with what works. No need to move away from it, right?

## A BODY IN MOTION

But there is a need. Resting on the past is not good when it stymies progress. You have to get your users to move forward. You are the “external force” that acts upon the “body at rest.” Your team may be resting and you need to act to get them moving.

*“The first rule of any technology used in a business is that automation applied to an efficient operation will magnify the efficiency. The second is that automation applied to an inefficient operation will magnify the inefficiency.”* – Bill Gates

Moving is where you want to be. Small efforts lead to great things. Just start rattling around and showing some antsy behaviors and people will take notice. Start moving yourself and others will follow. They will catch on and come alongside you as you seek to improve things.

## UNLESS IT IS ACTED ON BY AN EXTERNAL FORCE

You are the Force. May the Force be with You. You need to get them moving. Here are some tips for getting people unstuck and moving forward—a quick bulleted list of ideas. Many you have heard before; many you have tried before. This is not a priority list—just a stream of thought that I wrote down. Bottom line: just do something.

- ✦ Lunch and Learn (sorry—this is an old tip, but a good starting point)
- ✦ Buy new tools/utilities/programs
- ✦ Start complaining a little about small things (not total negativity, just unsettle things a little)
- ✦ Ask others for a better way
- ✦ Leak out new initiatives that might be coming
- ✦ Go to a tradeshow and come back and tell others what you saw
- ✦ Share something you read about
- ✦ Chat with someone you normally do not chat with
- ✦ Talk change up with influencers
- ✦ Drop hints at changes coming into conversations
- ✦ Leave tech magazines out around your office
- ✦ Hold a whiteboard brainstorm session and do not erase it for a week—just let everyone see it

- ✦ Start asking a lot of questions—is there a better way?
- ✦ Roll out a small change and then build on it
- ✦ Start talking about how things “could be”
- ✦ Start doing things differently yourself—lead the way
- ✦ Review the goals of your firm with others. Are we achieving this or that?
- ✦ Don’t change things just to change—find something worthy of changing first
- ✦ Applaud those that change something
- ✦ Talk about prior changes and how they helped the team to achieve success
- ✦ Think out loud (say it) “Maybe we could do this. What do you think?”
- ✦ Listen as other complain—offer improvements after you think about it

“People are very open-minded about new things, as long as they’re exactly like the old ones.”

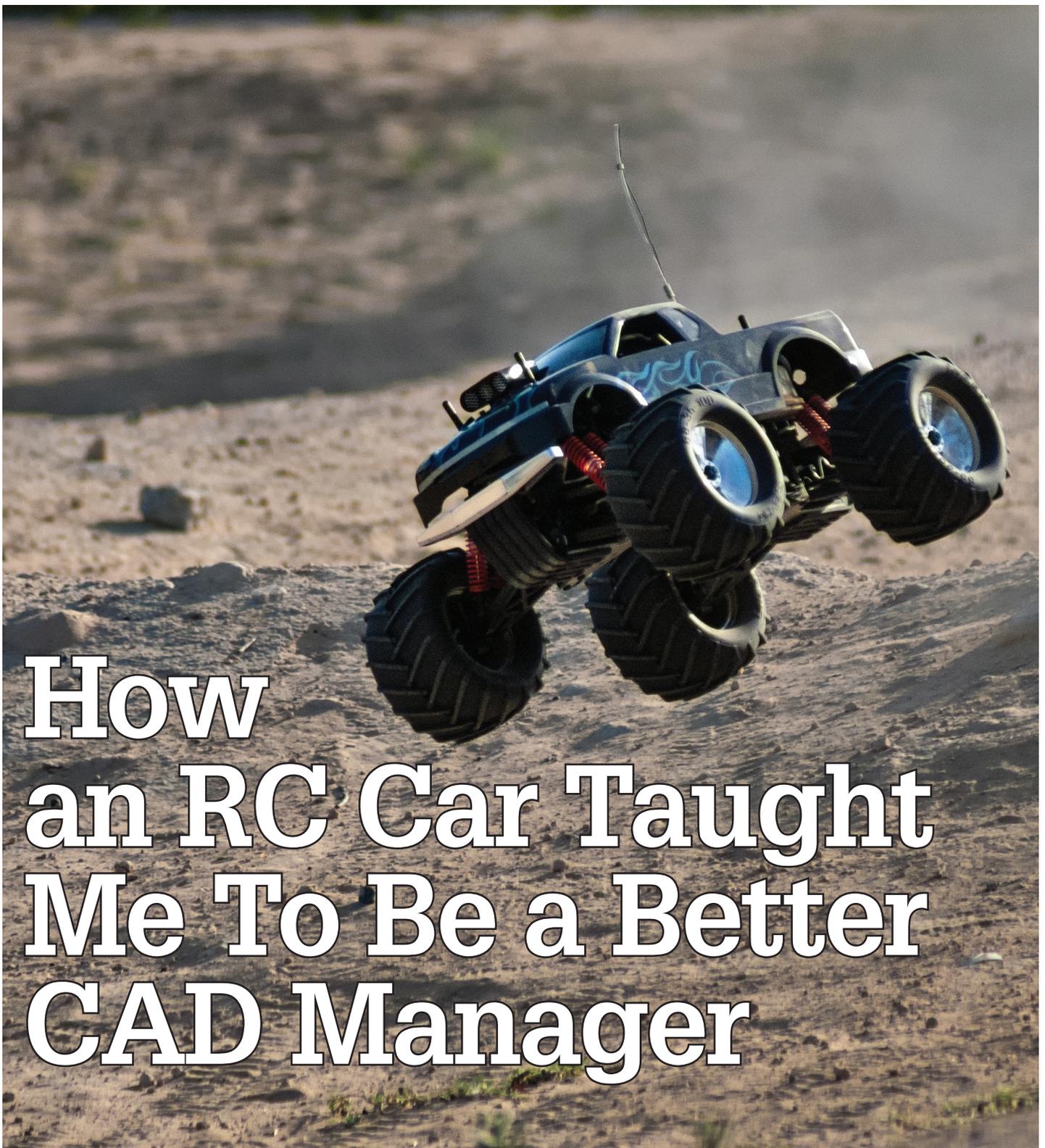
– Charles F. Kettering

By starting small, people will not get spooked by change. Change takes energy and some folks just don’t want to work at it. Charles Franklin Kettering may have said it best. Known as Charles “Boss” Kettering, he was an inventor, engineer, businessman, and the holder of 186 patents (including the electric automobile starter motor and in-dash radios). He was a founder of Delco, and was head of research at General Motors (1920 – 1947). Kettering said “People are very open-minded about new things, as long as they’re exactly like the old ones.” So true. But you can change that.

Don’t let stagnation infect your environment. Plan on making changes and do it soon. Start small and accelerate as you go. You can be the electric starter motor for your team. Time to turn over the engine.



Mark Kiker has more than 25 years of hands-on experience with technology. He is fully versed in every area of management from deployment planning, installation, and configuration to training and strategic planning. As an internationally known speaker and writer, he is a returning speaker at Autodesk University since 1996. Mark is currently serving as Director of IT for SIATech, a non-profit public charter high school focused on dropout recovery. He maintains two blog sites, [www.caddmanager.com](http://www.caddmanager.com) and [www.bimmanager.com](http://www.bimmanager.com).



# How an RC Car Taught Me To Be a Better CAD Manager

 I know what you're thinking. "What an odd and unlikely source of inspiration!" But hear me out. Times are changing. We see it at conferences such as Autodesk University every year. At first, many things seemed like far-off goals and dreams, but now we are working in a much more complex technological landscape. It's much like driving around an RC car on rocky terrain.

According to *Business Insider*, the World Economic Forum released a report on how technology will transform the workplace. Of the top 10 "must-have" skills listed, complex problem-solving skills was number one. In fact, the report states that "36% of all jobs across all industries will require complex problem-solving abilities as a core skill by 2020." (Curtin, 2018).

As CAD and BIM managers, we are faced with challenges of not only getting buy in, but also deploying all the shiny new technologies in the office, getting them all to work, maintaining them, and somehow constantly coming up with ways to improve and optimize them. It's a moving target.

Years ago, in job interviews, I used to state with pride that I was very detail oriented. I stated that as a great strength. I now know that if you don't also try to zoom out and look at the big picture every once in a while and how it all fits together, it's much like having your head stuck in a fish bowl.

Traditional problem-solving skills are focused on analyzing a problem down to its detailed parts, trying to optimize those parts, and then putting those parts back together. One thing causes an effect to occur; it's very linear. This kind of problem solving might work well for some problems and do result in the "quick wins" that many of us crave, but this alone just doesn't quite cut it for me anymore as a CAD manager. I'm here to persuade you that it shouldn't cut it for you anymore, either.

There are more complex problems out there in your workplace and beyond that require a different type of thinking to even begin to tackle them. What may appear one way on the surface might have many underlying things going on beneath the surface. How do you identify these kinds of problems? Well, a clue is when you try to apply traditional problem-solving skills to try to solve it. Did the problem come back? Did it not actually get solved? Did the "solution" actually cause the problem to get worse elsewhere in the long run? Bingo! These are more complex problems, and we would greatly benefit looking at them differently. So how do we do that? I'm here to tell you there are names for these much-needed skill sets, and one of them is called Systems Thinking (Aronson, 1996).

Now back to the RC car. How does this apply to Systems Thinking? Systems Thinking is about looking at the system as a whole and seeing how all the parts relate to each other, especially when you are trying to solve a problem or improve a situation. Forget linear for a moment. Think circular. Systems Thinking is more about synthesis of all the parts working together rather than analysis of parts in isolation. The links between the parts are so important.

I would say an RC car is an example of a system. Maybe not a complex one, but a system nonetheless. Completely disassembled, it really doesn't accomplish much. But put together in the right way, it results in a vehicle that can maneuver around by means of a controller communicating direction via radio waves.

What if a wheel falls off? Will that affect performance on different terrain? If batteries are dead, the car can't move. Are the batteries dead in the car or the remote controller? Or both? What if the batteries are working, but the wires aren't connected right? Is it a remote controller issue or a car issue? If all of that is working, what if someone is also driving an RC car next to yours? Ever had someone else's controller control your RC car by accident (or maybe a

prank?) They were likely on the same frequency, so the one controller affected the other car.

This all illustrates at a small scale that there are components connected together for a purpose, and they interact with other systems, too. An initial problem might have deeper issues that resulted in unfavorable behaviors we see on the surface. Breaking apart one RC car does not result in multiple RC cars, so why would we continue to break apart all problems in such a way? Granted, there is a lot more complexity to the systems we interact with in our workplaces and beyond, but I wanted to give a basic example to get the wheels turning. Get it? 😊

Now back to CAD management. How can the modern CAD and BIM manager apply this type of thinking and problem solving in his/her workplace when it comes to getting the buy in needed to make improvements? Here are the methods and tools I use. Please note that the examples given might look unrelated at first glance, but they are all instances that could happen concurrently for me on any given day, and I have the challenge of prioritizing and coordinating them in such a way that they don't affect each other adversely.

## LOOK FOR SYSTEMS

The goal here is to document the inputs, process, and output of the current system you would like to potentially improve, so you know what you're dealing with and can communicate it with others. When I want to document what a system looks like, I often book a conference room with a whiteboard so I can draw diagrams or jot down thoughts.

In my role, I follow the data from multiple departments to ensure it is translating and reflecting properly in manufacturer BIM content. This takes a lot of coordination and collaboration

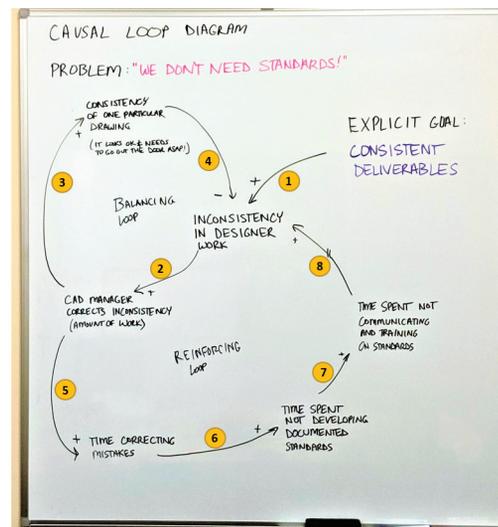


Figure 1

# CAD Management

across teams to make it all happen. Along the way from subject matter experts of the product itself to BIM modeler subject matter experts, there could always be potential for disconnects, miscommunication, and more.

If there is a communication gap along the way, traditional problem-solving skills might not recognize that and simply point fingers at one of the most visible parts of the system, the modeler(s) of the BIM content. Those with crucial Systems Thinking skills know to dig a bit deeper.

One of the tools I use in documenting systemic issues is a Causal Loop Diagram. Figure 1 shows an attempt at diagramming the need for CAD and BIM standards. The short-term solution of just making a quick fix for every project or request takes away time from building long-lasting standards. As CAD and BIM managers, we may know this to be true, but sometimes a visual can go a long way.

Drawing these types of diagrams takes some trial and error, but the main takeaway here is to show that there are circular links between ideas. If you would like to learn how to draw these diagrams, check out <http://www.thesystemsthinker.com>. There are also some great YouTube videos on it as well (<https://www.youtube.com/watch?v=tTo06jbSZ4M>). Back to this example, the numbered links go as follows.

The explicit goal may be to have consistent deliverables. But we're human, and sometimes things just aren't consistent in our work, especially if we have no documented standards.

If the CAD manager (or the person checking the work) just fixes inconsistencies, that increases the workload on those types of tasks.

The CAD manager fixes the drawing, and the consistency of that one project improves and goes out the door that day, yay! Problem solved, right?

However, this didn't magically fix the problem. There is inconsistency in the system of getting completed drawings out to clients.

Increased workload for the CAD manager on "quick fixes" increases time spent correcting inconsistencies over and over. Think "quick fixes" on new drawings, revisions, etc. With chaos, anything goes!

Increased time spent correcting inconsistencies increases time not spent developing and maintaining documented standards.

Increased time not spent on developing and maintaining documented standards increases time not spent on communicating and training on standards.

Inconsistency in designer work across the board is still present (the problem never actually went away).

This might seem like an obvious example, but essentially what I am trying to illustrate is that a "quick fix" doesn't really solve the initial problem. It just makes it look like a problem is "fixed" on the surface. This kind of diagram could be applied to properly maintaining and hosting BIM content, software licensing structures, analyzing ROI, and more. Yes, short-term and long-term solutions need to be considered together, but I use the diagram as a systemic problem identification tool in strategic planning.

## COLLABORATE TO GATHER INSIGHT

The goal here is to branch out and learn about an issue from multiple perspectives. This often means stepping "outside of your job description" and asking many questions to gather not only what is wrong, but what are the requirements to make it right. Sometimes this involves talking to just one or two people surrounding an issue. Other times it involves "campaigning" across multiple departments to get different takes on the matter if it affects many people. Be very careful that your potentially proposed "solution" doesn't just shift the burden to someone else.

For example, I collaborate and coordinate software deployments with the IT department. Sometimes our software deployments don't go well and it leaves people questioning why.

I once took it upon myself to learn how to deploy software through a program such as PDQ Deploy even though it was not "part of my job description." In just 30 minutes of my time, I learned through a quick tutorial that often the IT personnel having to deploy software don't get the right inputs and have to Google it. They also have to figure out coded information such as parameters and success codes as those things often aren't provided either. Those things can vary per product and per vendor, so they have to Google it. They also have to figure out all the conditions to essentially make this thing drive on its own to install software, and if they don't know those conditions, they have to Google it. See a theme here? (PDQ.com, 2015).

So, in 30 minutes of my time, I learned that the IT personnel having to write these software deployments have to get a lot of "guesses" right, and even then, something can go wrong. This presents a very differently painted picture compared to what is on the surface, doesn't it? Using this information, I was able to gather insight from the IT personnel to help improve upon my part in a software deployment process.

One of the tools I use to help with capturing insight is mind maps. Figure 2 shows what one might look like if I were to gather insight on evaluating CAD versus BIM workflows to address a challenge of trying to move everyone to a new software platform. Granted, the actual mind maps I put together have a lot more detail and are strategic in nature, but this is what the basic structure looks like. There are many online tools to do mind maps. I happen to use a free online tool called Mindmeister.



Figure 2

By creating mind maps, I can then link everything together and get to a point where I can write requirements for improving a process. I strive to write requirements in specific language and in multiple forms (visual + written) to ensure the message is being communicated effectively. If we were to write/illustrate our requirements on paper and leave it on the floor in the hallway, will someone who isn't familiar be able to follow it?

## MAKE A PROPOSAL TO STAKEHOLDERS

Putting it all together, I am then able to go to stakeholders with a proposed solution. The stakeholders are people who are highly interested in the success of something, so much so that it is their money and resources at stake, hence, *stakeholder*. Keeping this in mind, I now have multiple strong points to present:

1. Visual and written communication of the problem (causal loop diagrams, etc.).
2. Multiple perspectives on how a process could be improved or created (mind maps).
3. Data in terms of time and money to implement (time/cost of proposed solution and implications of non-implementation).

## CONCLUSION

To conclude, I hope these tools I have presented will result in stronger cases for improvement within your department that leave no stone left unturned. Increasing the chance for buy in across the teams will help increase your influence as a CAD and BIM manager and as a strategic process leader. What I have described here is just the start of a lot of other frameworks and theories on problem solving. I'm always learning and want to encourage you to keep learning, too. Complex problem-solving skills are needed for today's CAD and BIM manager as we navigate the increasingly complex technological landscape in the AEC world in our little RC cars. Speaking of which, I need to sneak my son's RC car back into his room as he was not aware that I borrowed it to write this article. 😊

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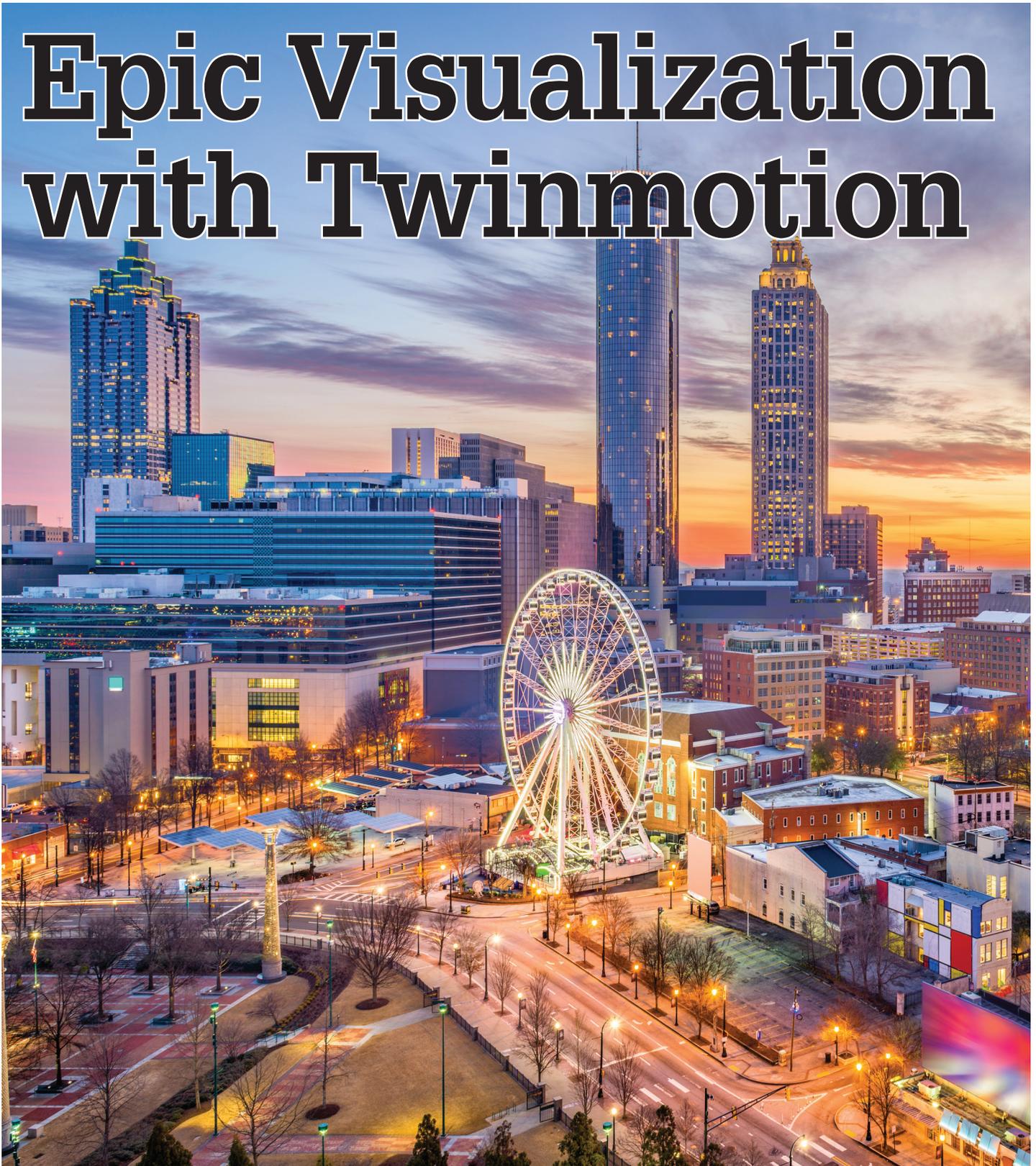
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# Epic Visualization with Twinmotion



**R**ecently, Epic Games acquired Abvent's Twinmotion software. This is a new addition to the Unreal Engine 4 tools. With Twinmotion, users can easily produce high-quality images, panoramas, and standard or 360° VR videos in mere seconds. For architecture, construction, urban planning, and landscaping professionals, Twinmo-

tion offers an "easy to use" interface that is incredibly powerful. From now until November 2019, anyone can create a free Epic Games account and download Twinmotion for free! Let's take a look at the workflow from InfraWorks® to Twinmotion and view the results.



Figure 1

## IN INFRAWORKS

InfraWorks users already know how easy it is to get a basic model of the project area. Once Model Builder creates the terrain, roads, aerial, buildings, and water, it's a little cumbersome to achieve a great looking presentation for a client. See Figure 1.

As you can see in the image, it doesn't look too bad. However, we can make this much more appealing.

First, we are going to export our model out to an FBX file. Click the Setting and Utilities icon, then choose Export 3D Model, as shown in Figure 2.

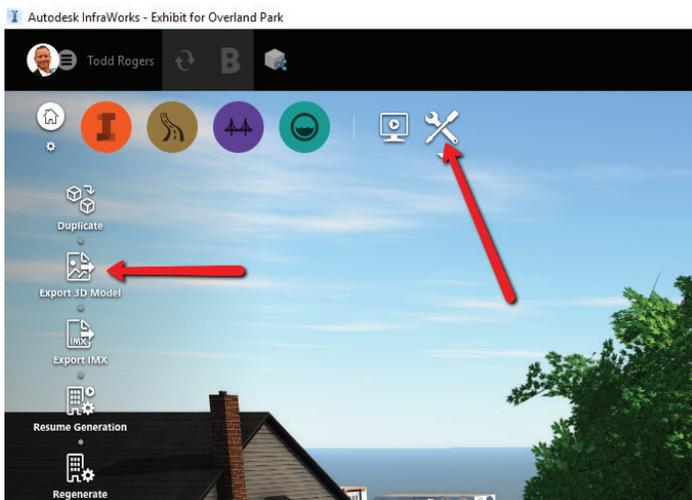


Figure 2

Here you can choose to export out the entire model or use a selection method to select the area you want to export. I am going to use the selection method because I only want to bring in a small portion (Figure 3).

Even though Twinmotion doesn't know what a coordinate system is, it is important to set a coordinate system. I will explain why later in the article. Now that you have your area selected, your coordinate system set, and your file named and located, you can click the Export button. You can now exit InfraWorks.

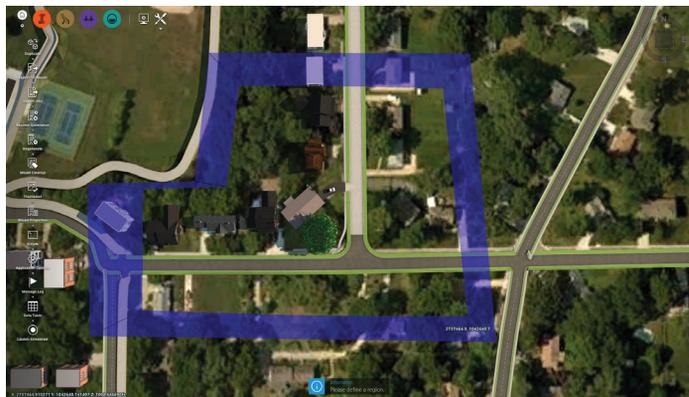


Figure 3

## IN TWINMOTION

When you start up Twinmotion, the first thing you will see is a skyline and the import option (Figure 4).

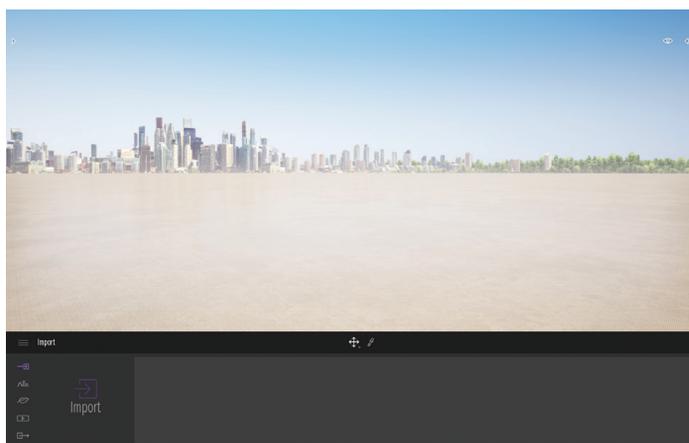


Figure 4

Click Import. A dialog box will appear. Browse to your FBX file. You can now either expand Options, or just go ahead and click Ok. I have never changed any settings under Options. You also have the option to bring in your own custom landscape. A dialog box will appear, warning you that you have a material conflict. Toggle the radio button for Keep both, then click Ok (Figure 5).

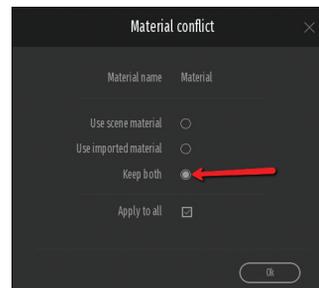


Figure 5

If you are using a coordinate system, more than likely you will not see your model right away. You will probably have to look up and around to find it. I have found the easiest way to locate it is

# InfraWorks

to look for the shadow on the ground. Navigation can be a bit cumbersome, but once you get used to it, it's rather easy. I have located the shadow. Now I know that my model is above that (Figures 6 and 7).



Figure 6

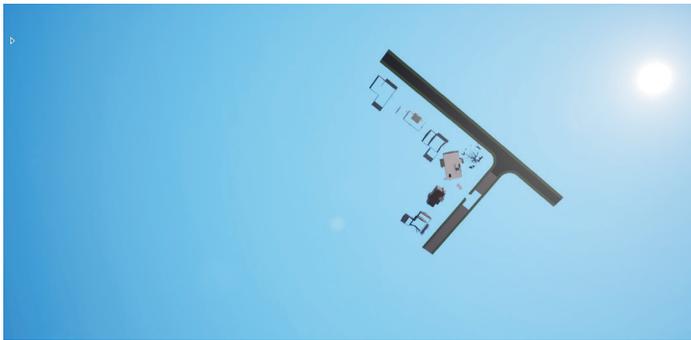


Figure 7

Do NOT move your model to the landscape. Rather, you will move the landscape to your model. I will explain this later in the article. Click on your landscape and you will see a gizmo appear. If you don't see the gizmo, zoom out a bit (Figure 8).

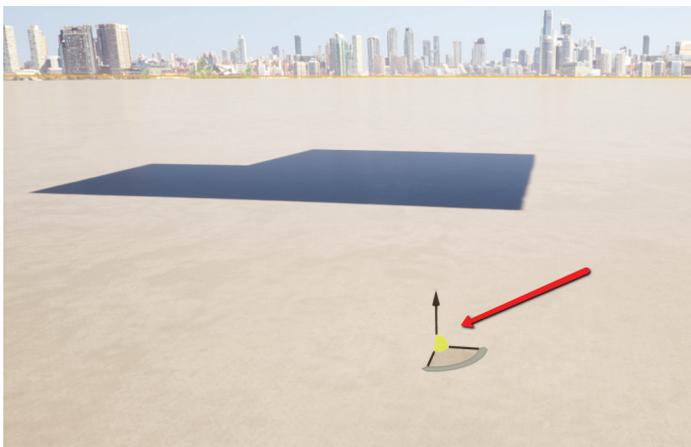


Figure 8

Continue moving your landscape to your desired position. Notice that when I moved my landscape, the skyline did not move with it. Sometimes this happens, and you will be required to create a custom background. There are several videos out there that show how to achieve this. No worries, we will be all right without it for now. As you can see in Figure 9, the InfraWorks model looks quite cartoonish. An easy fix.



Figure 9

We are simply going to drag and drop materials from the material list (Figure 10).

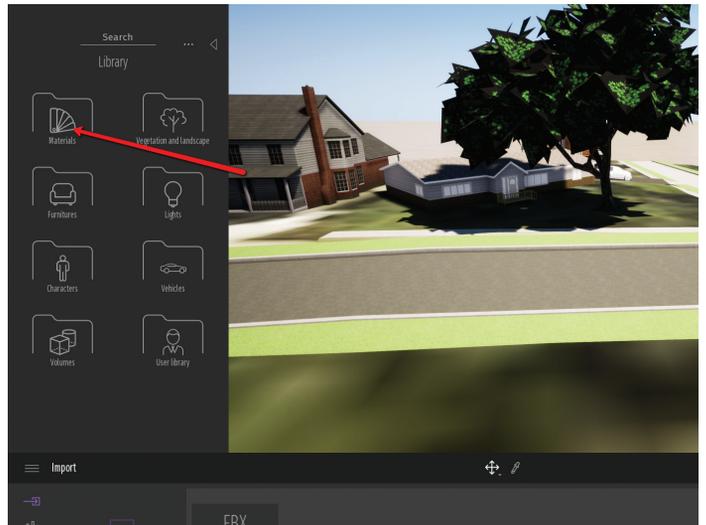


Figure 10

Continue dragging and dropping materials into your scene to get your desired look (Figure 11).

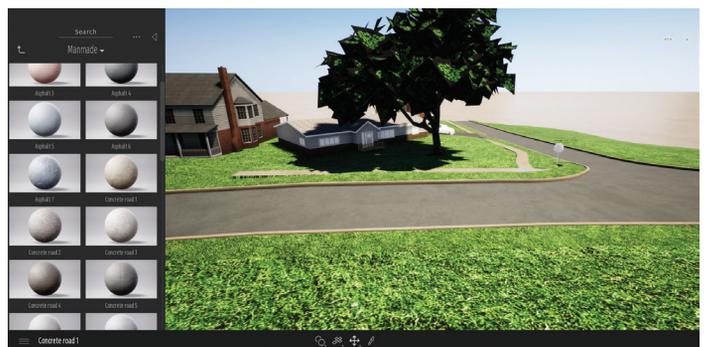


Figure 11

Next, we are going to place some scene objects, and replace other objects such as the trees, signs, etc. There is a bunch of items built into Twinmotion, and you can also find more items online.

BIMObject is also built into the program. As you can see in Figure 12, the scene is much more realistic. And I did everything you see in less than five minutes.



Figure 12

Suppose you wanted to see what it looks like when it is Autumn, or raining, or even snowing. This can be simulated with ease by using the slider bar shown in Figures 13 and 14.

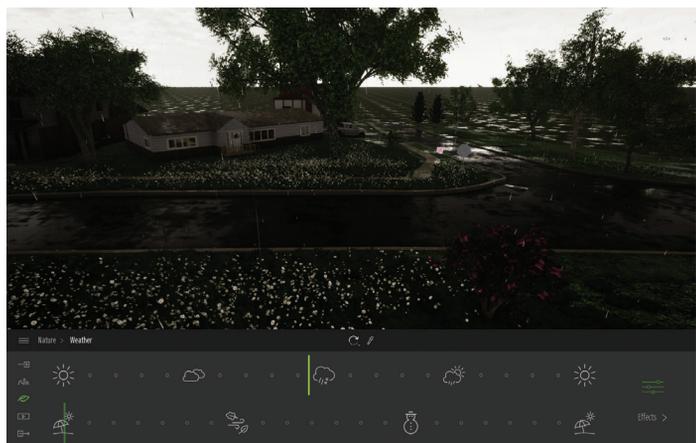


Figure 13

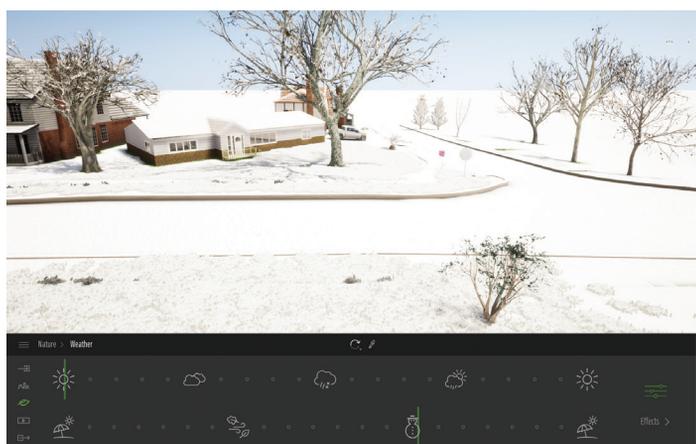


Figure 14

What about the time of day? At night with lighting? This can be done with a simple slider bar as well, as shown in Figure 15.



Figure 15

Other great features of this program are the automatically animated vehicles, people, animals, and more. When you have placed all these objects in your scene, then it's time for export. The options to export are images, panoramas, videos (with scene sound), and BIMmotion.

## CONCLUSION

Twinmotion is an ideal software for showing clients not only the look and feel, but also the mood and atmosphere of existing and future surroundings. This easy-to-use solution is well worth downloading and immersing yourself in a self-created environment.



Todd Rogers is a certified Partner Service Expert (P.S.E.) and certified Autodesk instructor with more than 25 years of experience in teaching, managing, and providing hardware and software solutions for hundreds of engineering firms throughout the greater Houston, Texas, area. Todd is a valued member of Walter P Moore, where he works as a BIM Manager. He also holds the "Autodesk Expert Elite" status, a program to recognize individual community members who have made extraordinary contributions with helping customers by sharing knowledge, providing community leadership, and exemplifying an engaging style of collaboration that drives a healthy and valuable Autodesk customer community. Todd is an active blogger. Through his personal blog website ([civil3dj.wordpress.com](http://civil3dj.wordpress.com)), he shares tips and solutions with Autodesk software issues.

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## SWEEP PROFILE

<https://apps.autodesk.com/3DSMAX/en/Detail/Index?id=4995208432514712677&appLang=en&os=Win64>



Script allows for a quick and convenient build of architectural profiles with Modifier Sweep in 3ds Max. Free pack includes 10.

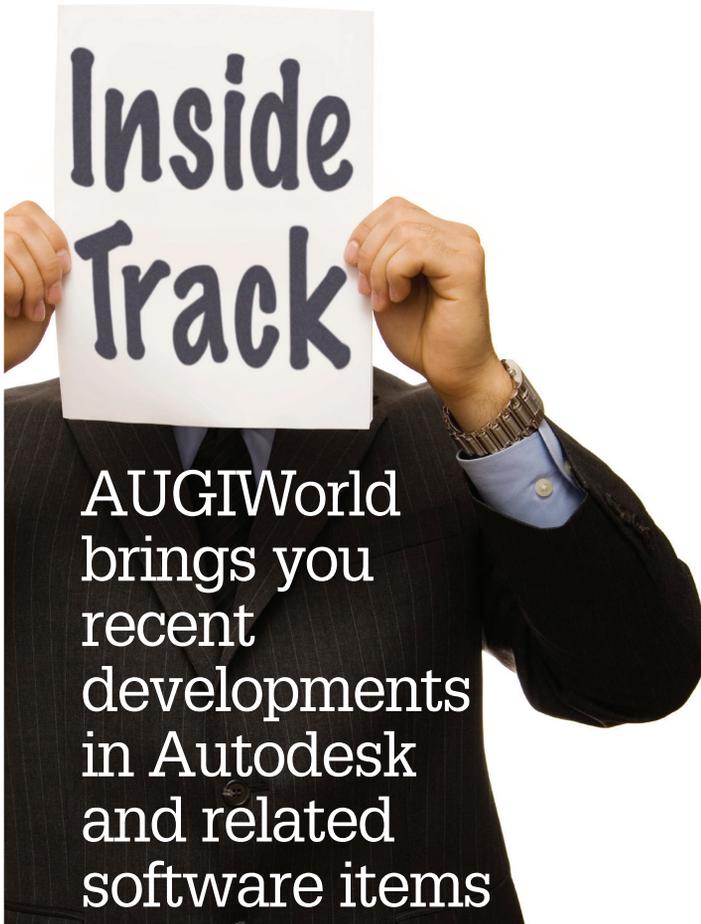
Users can add/change custom profiles in the folder: "%USERPROFILE%\AppData\Local\Kstudio\data\Section"

## SCATTER

[https://apps.autodesk.com/ACD/en/Detail/Index?id=1680774748299636997&appLang=en&os=Win32\\_64](https://apps.autodesk.com/ACD/en/Detail/Index?id=1680774748299636997&appLang=en&os=Win32_64)



Uses random number generator to nudge regularly placed object patterns in XY, XYZ, or along a selected curve. Applies uniform or normal distribution. Optionally you can also randomly rotate, scale, thicken, or recolor selected objects. Can be used to add real-life touches to automatically generated arrays such as orchards, parking, and crowds. Make sure you explode a dynamic array before you scatter its elements.



## FREE COPY OR MOVE

[https://apps.autodesk.com/ACD/en/Detail/Index?id=5074286617653853166&appLang=en&os=Win32\\_64](https://apps.autodesk.com/ACD/en/Detail/Index?id=5074286617653853166&appLang=en&os=Win32_64)



This plug-in allows users to change the rotation, base point, scale, and many other options while copying or moving objects. It also supports real-time undo and object snap; polar tracing is also available. If the selection set is too slow to drag, it will automatically enter copy or move command.

## ADVANCED REVISION CLOUD

<https://apps.autodesk.com/RVT/en/Detail/Index?id=4892647172737053141&appLang=en&os=Win64>



This add-in will help you manage your Revision Clouds with advanced tools in Revit. Features include:

- Filter: Show clouds only from a specific revision, view, sheet, or by the text in the Comments.
- Show Revision Cloud: Now you can find all your revision clouds inside any view. Pick a cloud from the list and push Show Revision Cloud.
- Delete Revision Cloud: From the add-in Form you can easily delete clouds.
- Export to Excel: Export a complete schedule with all the information about the revision clouds including grid location, view location, coordinates, extended data.
- Export Images with the Excel File: You can choose to include images of each revision cloud in the Excel report.
- Extensive Data: Adds three additional fields of data to each revision cloud: Response, Responsible, and Status. This additional information will help manage your coordination sessions and keep track of changes, status, and assign a Responsible for each query.
- Dynamic Graphics: Visualize the current state of your project in the new Graphics tab.

## TRIMSPLIT

[https://apps.autodesk.com/ACD/en/Detail/Index?id=2107439518663618652&appLang=en&os=Win32\\_64](https://apps.autodesk.com/ACD/en/Detail/Index?id=2107439518663618652&appLang=en&os=Win32_64)



The STRIM command allows picking a set of 3DSolids as the trimming objects and a selection set of overlapping 3DSolids, from which the overlapping portion will be removed without deleting the trimming solid. The option for selecting either ALL trimming solids or ALL the solids to be trimmed streamlines the workflow further.

If you have some news to share with us for future issues, please let us know. Likewise, if you are a user of a featured product or news item and would like to write a review, we want to know: brian.andresen@augi.com

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# Quest for Hidden Efficiencies

**H**ow can we capture a few percentage points of efficiency, time, and money?  
 Lots of ways! Today, let's chat naming organizations.

In our ongoing professional growth, we have already begun to model with NO WARNINGS, right? If not, you are failing AEC and yourselves, friends and families... no joke... that said (and back to a place for more potential efficiency and effectiveness) let's get "organized" :)

One of the myriad documents to track and manage I suggest creating is a nice list of all families used (and appropriate to use) in

Title Blocks	00 FirmName Titleblock
View Reference	00 View Reference
View Titles	00 View Title
	00 View Title_Double Line
Callout Heads	00 Callout Head
Elevation Marks	00 Elevation Mark Body.Circle
	00 Elevation Mark Pointer_Circle
Grid Heads	00 Grid Head
	00 Grid Head Color
Level Heads	00 Level Head
	00 Level Head.Circle
Section Marks	00 Section Head_Filled
	00 Section Head_No Arrow
	00 Section Head_Open
	00 Section Tail_Filled Horizontal
	00 Section Tail_Filled Vertical
Generic Annotations	01 Centerline_Anno
	01 Centerline_Dimension
	01 North Arrow
Spot Elevation Symbols	01 Spot Elevation_Crosshair
	01 Spot Elevation_Target Filled
	Beam Elevation (Project)
	Beam Elevation (Relative)
	Crosshair (Project)
	Crosshair (Relative)
	Dot at Leader (Project)
	Dot at Leader (Relative)
	Dot at Leader (Snared)
	Dot Leader (Project)
	No Symbol (Project)
	No Symbol (Relative)

Figure 1

a project (See Figures 1 and 2). These documents are shared and read and ACTUALLY LEARNED!

Figures 1 and 2 illustrate the document in question... a list is included at the end of this article as well.

I wish to lead you down a path to being (or becoming) an autodidact of sorts. Notice the naming convention... you might notice the word "Tag" in front of the item's tag name. Why? A remnant to get all annotations (possible) to organize in groups. The numbering system was a later inclusion to further organize (and standardize to a limited degree).

Create naming conventions for everything you use on any regular basis—any outside components brought in subsequently (families, materials, etc.) will be found out quite quickly, as they will organize

Property Tags	02 Tag Property
Property Line Segment Tags	02 Tag Property Line
Site Tags	02 Tag Site
Area Tags	02 Tag Area
Area Load Tags	02 Tag Area Load
Assembly Tags	02 Tag Assembly
Casework Tags	02 Tag Casework
Ceiling Tags	02 Tag Ceiling
Curtain Panel Tags	02 Tag Curtain Panel
Curtain System Tags	02 Tag Curtain System
Detail Item Tags	02 Tag Detail Item
Door Tags	02 Tag Door
Floor Tags	02 Tag Floor
Furniture Tags	02 Tag Furniture
Furniture System Tags	02 Tag Furniture System
Generic Model Tags	02 Tag Generic Model
Mass Tags	02 Tag Mass
Mass Floor Tags	02 Tag Mass Floors
Material Tags	02 Tag Material
Multi-Category Tags	02 Tag Multi-Category
Parking Tags	02 Tag Parking
Part Tags	02 Tag Parts
Planting Tags	02 Tag Planting
Railing Tags	02 Tag Railing
Revision Cloud Tags	02 Tag Revision
Roof Tags	02 Tag Roof
Room Tags	02 Tag Room
Specialty Equipment Tags	02 Tag Specialty Equipment
Stair Tags	02 Tag Stair
Stair Landing Tags	02 Tag Stair Landing

Figure 2

at the end of the browser sections. Then they can be validated for use or replacement.

Using such content rigor in the naming (and use of tested and validated content) will serve every project well and will allow further programmatic enhancements from the likes of Dynamo and others. Below is a list of Annotation Categories for inspiration. Do a bit of industry standards research (NBIMS, etc.), devise a rigorous naming and organization set of processes, and you will find that projects run smoother and allow more actual architecture to be done, rather than fighting lost, duplicate, and incorrect content.

## ANNOTATION CATEGORIES

CATEGORY	TAG NAME		
Title Blocks	00 FirmName Titleblock	Target at Leader (Relative)	
View Reference	00 View Reference	Target at Leader (Shared)	
View Titles	00 View Title	Target Leader (Project)	
	00 View Title Double Line	Target w Dot Leader (Project)	
Callout Heads	00 Callout Head	Property Tags	02 Tag Property
Elevation Marks	00 Elevation Mark Body.Circle	Property Line Segment Tags	02 Tag Property Line
	00 Elevation Mark Pointer_Circle	Site Tags	02 Tag Site
Grid Heads	00 Grid Head	Area Tags	02 Tag Area
	00 Grid Head Color	Area Load Tags	02 Tag Area Load
Level Heads	00 Level Head	Assembly Tags	02 Tag Assembly
	00 Level Head_Circle	Casework Tags	02 Tag Casework
Section Marks	00 Section Head_Filled	Ceiling Tags	02 Tag Ceiling
	00 Section Head_No Arrow	Curtain Panel Tags	02 Tag Curtain Panel
	00 Section Head_Open	Curtain System Tags	02 Tag Curtain System
	00 Section Tail_Filled Horizontal	Detail Item Tags	02 Tag Detail Item
	00 Section Tail_Filled Vertical	Door Tags	02 Tag Door
Generic Annotations	01 Centerline_Anno	Floor Tags	02 Tag Floor
	01 Centerline_Dimension	Furniture Tags	02 Tag Furniture
	01 North Arrow	Furniture System Tags	02 Tag Furniture System
Spot Elevation Symbols	01 Spot Elevation_Crosshair	Generic Model Tags	02 Tag Generic Model
	01 Spot Elevation_Target Filled	Mass Tags	02 Tag Mass
Beam Elevation (Project)		Mass Floor Tags	02 Tag Mass Floors
Beam Elevation (Relative)		Material Tags	02 Tag Material
Crosshair (Project)		Multi-Category Tags	02 Tag Multi-Category
Crosshair (Relative)		Parking Tags	02 Tag Parking
Dot at Leader (Project)		Part Tags	02 Tag Parts
Dot at Leader (Relative)		Planting Tags	02 Tag Planting
Dot at Leader (Snared)		Railing Tags	02 Tag Railing
Dot Leader (Project)		Revision Cloud Tags	02 Tag Revision
No Symbol (Project)		Roof Tags	02 Tag Roof
No Symbol (Relative)		Room Tags	02 Tag Room
Target (Project)		Specialty Equipment Tags	02 Tag Specialty Equipment
Target (Relative)		Stair Tags	02 Tag Stair
Target at Leader (Project)		Stair Landing Tags	02 Tag Stair Landing
		Stair Paths	N/A
		Stair Run Tags	02 Tag Stair Run
		Stair Support Tags	02 Tag Stair Support
		Wall Tags	02 Tag Wall
		Window Tags	02 Tag Window
		Keynote Tags	03 Keynote_Documentation
			03 Keynote_Presentation
		Stair Tread/Riser Numbers	N/A
		Brace in Plan View Symbols	N/A
		Connection Symbols	N/A
		Displacement Path	N/A
		Foundation Span Direction	

# Revit Architecture

Symbol	N/A	Electrical Fixture Tags	06 Tag MEP Electrical Fixture
Rebar Cover References	N/A	Flex Duct Tags	06 Tag MEP Flex Duct
Span Direction Symbol	N/A	Flex Pipe Tags	06 Tag MEP Flex Pipe
Span Direction Symbol	05 Span Direction	Internal Area Load Tags	06 Tag MEP Internal Area Load
Structural Annotations	N/A	Internal Line Load Tags	06 Tag MEP Internal Line Load
Structural Area Reinforcement	N/A	Internal Point Load Tags	06 Tag MEP Internal Point Load
Analytical Beam Tags	05 Tag Analytical Beam	Lighting Device Tags	06 Tag MEP Lighting Device
Analytical Brace Tags	05 Tag Analytical Brace	Lighting Fixture Tags	06 Tag MEP Lighting Fixture
Analytical Column Tags	05 Tag Analytical Column	Line Load Tags	06 Tag MEP Line Load
Analytical Floor Tags	05 Tag Analytical Floor	Mechanical Equipment Tags	06 Tag MEP Mechanical Equipment
Analytical Isolated Foundation Tags	05 Tag Analytical Isolated Foundation	Nurse Call Device Tags	06 Tag MEP Nurse Call Device
Analytical Link Tags	05 Tag Analytical Link	Pipe Tags	06 Tag MEP Pipe
Analytical Node Tags	05 Tag Analytical Node	Pipe Accessory Tags	06 Tag MEP Pipe Accessory
Analytical Slab Foundation Tags	05 Tag Analytical Slab Foundation	Pipe Fitting Tags	06 Tag MEP Pipe Fitting
Analytical Wall Tags	05 Tag Analytical Wall	Pipe Insulation Tags	06 Tag MEP Pipe Insulation
Analytical Wall Foundation Tags	05 Tag Analytical Wall Foundation	Plumbing Fixture Tags	06 Tag MEP Plumbing Fixture
Structural Beam System Tags	05 Tag Structural Beam System	Point Load Tags	06 Tag MEP Point Load
Structural Column Tags	05 Tag Structural Column	Security Device Tags	06 Tag MEP Security Device
Structural Connection Tags	05 Tag Structural Connection	Space Tags	06 Tag MEP Space
Structural Foundation Tags	05 Tag Structural Foundation	Sprinkler Tags	06 Tag MEP Sprinkler
Structural Framing Tags	05 Tag Structural Framing	Telephone Device Tags	06 Tag MEP Telephone Device
Structural Rebar Tags	Multi-Rebar Annotations	Wire Tags	06 Tag MEP Wire
Structural Fabric Reinforcement	05 Tag Structural Reinforcement Fabric	Zone Tags	06 Tag MEP Zone
Structural Path Reinforcement	05 Tag Structural Reinforcement Path		
Structural Stiffener Tags	05 Tag Structural Stiffener		
Structural Truss Tags	05 Tag Structural Truss		
Air Terminal Tags	06 Tag MEP Air Terminal		
Fire Alarm Device Tags	06 Tag MEP Alarm Device		
Cable Tray Tags	06 Tag MEP Cable Tray		
Cable Tray Fitting Tags	06 Tag MEP Cable Tray Fitting		
Communication Device Tags	06 Tag MEP Communication Device		
Conduit Tags	06 Tag MEP Conduit		
Conduit Fitting Tags	06 Tag MEP Conduit Fitting		
Data Device Tags	06 Tag MEP Data Device		
Duct Tags	06 Tag MEP Duct		
Duct Accessory Tags	06 Tag MEP Duct Accessory		
Duct Fitting Tags	06 Tag MEP Duct Fitting		
Duct Insulation Tags	06 Tag MEP Duct Insulation		
Duct Lining Tags	06 Tag MEP Duct Lining		
Electrical Equipment Tags	06 Tag MEP Electrical Equipment		

Shakespeare may not mind what a rose is called, but Revit®, Dynamo, The Client, etc. all do and we all should (in BIM at least;)



Jay B Zallan | AECO | VDC | Design/Construction Technology Conductor | Fine Artist

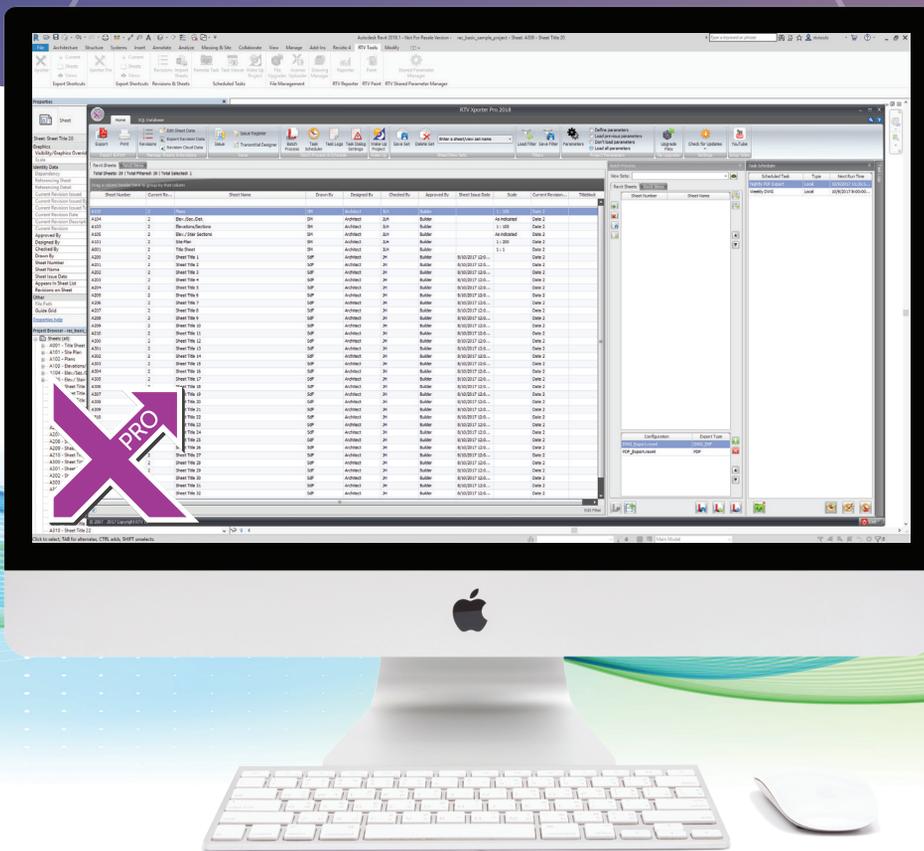
Mr. Zallan brings wide-ranging Design, Delivery, Management, Mentoring and Teaching experiences to the readily changing AECO industries, founded on an expansive 35 plus year career.

Jay has focused on VDC planning, production, process development and research & development; to help enable efficiency-generative creative project execution, delivery and success throughout the AECO landscape.

This JayZ is an educator, author and industry lecturer throughout the BIM world; Jz strives to inspire current and future generations to achieve and exceed beyond even their own expectations.

Being a Fine Artist (large format oil & mixed media canvases), Jay adds unique and collaborative insights and perspectives to every team he is part of.

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