SAMUEL MACALISTER: So my name's Samuel Macalister. I'm based in Sydney, Australia. I've been at Autodesk for about five years. My background is architecture. And this is going to be a presentation on how to use our new master painting application InfraWorks 360 in the architecture space.

There's going to be three parts to it. So the first part is going to be looking at data together, like where do you get all the context to build up your cities, what can you put in it, how can you convert the data in different software sources.

The second part will be how to develop those design proposals. So if you're working in Revit or SketchUp or FormIt, how to bring the information in and start designing it in the context of the city.

And then the final section, we'll be doing the presentation and the analysis of the designs.

So just to mention, I'm in Sydney, Sydney, Australia, so I'm a little bit jet-lagged at the moment. I keep on waking up about 3:00 in the morning, and trying to get back to sleep. So I'm sort of running on empty today, but I'll do my best to try and stay awake for the presentation.

I've been at Autodesk for about five years now. I was an architect for about 10 years in the UK, working in London, and designed buildings globally, in New Zealand, Australia, did a lot of work in the Emirates, and of course UK, and Middle East. During those 10 years, I was working for some quite large practices, so RMJM Architects, HOK, and Building Design Partnership.

What was interesting, especially working in the UK, is it's all-- a lot of the projects were construction lead, so it was a design and built procurement. So the contractor was with you on day one, sitting at the table telling you couldn't do curved roofs and two directions and making sure that you did everything square and it was easy. So we're working in conjunction with Balfour Beatty, Laing O'Rourke, and Carillion.

Some of the projects I was involved with where schools and universities, so on the left here, the University of Hertfordshire with Carillion at RMJM, the right, [INAUDIBLE] Walworth Academy with Balfour Beatty. When the recession hit the UK, we got the phone calls from the banks telling us there was no more funding for the project, so we spent a lot of time using the visualization tools to try and win work in places like Qatar. The image on the left is a military hospital in the middle of the Qatari dessert, on the right, a charity project for the British Trust.

Some of the projects that still maintained funding were a lot of the healthcare and university projects. The one on the left is the trauma center for Brighton Hospital, and this was back in about 2010, in Revit before we had dividing parts. We actually had to build the model using the curtain walling system to the prefabricated part sizes for the concrete panels that you see on the side of the building, they had to match [INAUDIBLE] explore factory systems. So there was a lot going on with the contractor telling us how we had to build the model to work into the fabrication.

And then on the right is the Medical Research Council building for the University of Cambridge. This was started originally in ADT, which is now AutoCAD Architecture, but when it was finished, it was actually rebuilt in Revit.

At Autodesk, I've got about 47 products that I evangelize, because I'm in Australia, sort of a jack of all trades, so I get exposure to a lot of software. I get to use Revit a little bit, not as much as I would like. My claim to fame at Autodesk was that I got to design the dataset that ships with Revit, the house model. They did dumb it down a little bit for the release, but this is the original version where it's fully detailed and it's got [INAUDIBLE] and it's got structural components and it's got all the one-to-one detail. So if anybody wants a copy of this, please let me know.

And I really enjoy the visualization side of our applications. This is some people from a company that used to be called Rockerbox, [INAUDIBLE] nurse's from Revit linked into Max. They're all rigged to animate, because the guy in the back there has had enough drugs to kill a small horse. And the point of this is that after working in healthcare, you can start to look at the ergonomics of the furniture and start to interact with the design, because it's all about the people or the patients who work with that building.

So three parts, as I mentioned at the beginning. The data gathering. So you're looking at several different places where you can get the data from, a lot them are free. You do on the full version of InfraWorks 360 get Model Builder. This isn't going to go too much into that. It's going to show you several places where you can get various sources, and then aggregate them to use inside of InfraWorks.

So the first one is ReCap. That's our application that reads all the laser scanning data. For those who were in here a little bit earlier, you saw the laser scan of Han Solo frozen in

carbonite. We'll be coming to that later. Civil 3D, so AutoCAD Civil 3D, it's great for bringing in all the data and real world coordinates. Raster Design if you're bringing in aerial imagery, how to locate that data in the right place. FormIt 360, excellent for just building up contextual buildings, and some SketchUp data, and NearMap, which is aerial imagery. It's an Australian-based company. But just showing you how you can bring that information and start to build up the context of your site.

The second part, we're moving into design. So of course, working with your Revit data, locating it in the right real world coordinates. I'll try and jump into a couple of demos. It'll just be basic demos, but there's more detailed stuff online.

3ds Max, you can do some great basic animations inside of Max, and take DAE files into InfraWorks and it starts to read some of the animated components. InfraWorks 360, of course, for doing end product design. FormIt for doing design options, and then Autodesk Seek has some data you can reuse inside the product.

And then the final part, we'll be covering how to analyze and present your designs.

So there's a tool that's called Autodesk Flow Design. It used to be Project Falcon inside of Revit, where you can do your wind/wake analysis around the perimeters of the buildings. 3ds Max for working, we'll say animated cars, if you want to use Civil view. InfraWorks 360 will draw a bit of a live demo on that, just how to create a storyboard and how to get out of a real-time animation within minutes, as opposed to hours or days.

And then AutoDesk Pixlr, which is kind of like Photoshop on the cloud. It's free. It's just a web browser. And you can start to do things like overlaying different layers of outputs to shadows, and then looking at the differences that the shadows cast from the buildings.

So there's going to be a lot of software, probably a lot to take in. We can do a bit of Q & A at the end and maybe go back over some stuff.

So first section is going to be data gathering.

We're going to look at setting up coordinate systems, so using Civil 3D to get the real world coordinates and then link that up with your Revit data. Aerial imagery, we're using NearMap, the Australian company. Shape files, there's a number of free websites where you can get this information from, but what I'm going to show is called BBBike, which is actually a German cycling website, where you can get shape files down for free. And then concept design, so a

lot of people use SketchUp. However, you can do some cool concept design in FormIt. With a combination of maps, you can start to build up the city context. And then laser scanning. I've got a scan of this particular site, and I'll be showing how you can convert that into topography meshing data.

OK. So as I mentioned, I'm based in Sydney, Australia, a really long way from here. For this project, I'm going to working with the map grid of Australia, 56, which is down in New South Wales on the east coast. And there's going to be working with the 1994 GDA data. This is kind of a core thing to get set up at the beginning. I had to get some help from some of our civil and survey guys to make sure I've got the right location. If you don't get this right, then sometimes you can load in your Revit models, and they'll come out a little bit. So just make sure you're working with the right type of coordinate system.

You can check local government websites. There's the New South Wales government website that's got information that I need to know to ensure that I'm working with the right coordinate system, and then any data that I bring into that model will come into the right location.

So with AutoCAD Civil 3D and InfraWorks, you can find this information loaded in the program, and I'll show a recording on this in a second. But you've got your zone categories. So we're going to pick Australia. The available coordinate systems, and for this one, there's a lot of MGA coordinate systems, so I had to make sure I was choosing the 1994 one. And then I'm going to be replicating that as well in InfraWorks 360.

So the idea in this workflow is to use the Autodesk Civil 3D to check all the information, and then when I bring it into InfraWorks 360 and just place it with that map grid of Australia, everything's going to come into the right place.

So this is bringing up the menu. So how many people have used Civil 3D? OK. Oh, good. That's good. So if anybody hasn't used it, you can just right click on the menu here and bring up all these different coordinate systems. And you see for someone who might be new to it, there's a lot to choose from. So you've got to make sure you're getting the right information here.

This is going to be setting up the model to bring in NearMap aerial imagery. So this is an Australian company, and you can go and zoom to anywhere in the world, and pick up your maps. So I'm going to be working with 60 Martin Place for this particular presentation. It's

actually based on a real project. There's a building here-- That one there-- that's going to be demolished in a couple years' time and they're going to be putting up a new project, so I'm replicating the design and build of that particular site.

And what we can do is we can start to choose aerial images taken at different times of day. So we're using this as the base of our model, and I don't want the images with the long shadows, because when you go and texturize it on the base, it's not going to look quite right.

So what you have in the top part of the NearMap application is different dates of the year, where the satellite photo was taken, so you can start the zoom and zoom back to get the right shadows. And then with that, you can choose the section of the city that you want, and then you're downloading it, and you're using the correct real world coordinate system.

So again, I'm going to be saying this quite a few times. Bringing down GDA, '94, map grid of Australia, zone 56. So that way I know that the data I'm bringing down from the aerial imagery is located in the right coordinates. And being the architect, I want to choose the most detailed graphics possible. So I'm going to get a very-- the highest detail. It's a reasonable large map. It's about 5,700 pixels wide.

So this is the workflow. So bringing in the-- doing a the start up file. So this is setting up your coordinate system. So right clicking, and editing up, and then doing a drop down for your location. So pretty much everywhere in the world is set up. You can put that in or you can start to enter in your own coordinate system.

So I've set that up. And I've got the Raster replication add-in installed here. And this is bringing in the aerial imagery from NearMap. I can check those coordinates as well to make sure that they are set up in the real world coordinates. And now I have that image in my file.

What I want to do is coordinate this with my InfraWorks model. So I'm drawing a closed polyline around that map, and exporting it out as a shapefile. A couple things to do here is to make sure it's closed, make sure it's a polygon, and make sure you treat them as closed. And then exporting it out, so we're using the map export for that shapefile.

And then when we bring it into model builder-- So if you're using the internet service to grab that particular location in the world, instead of manually dragging around the site, you can actually bring in the shapefile and that will get the exact same location, the exact same site boundaries. So there's sort of a workflow to be accurate between the two softwares when

you're using those shapefiles for the export.

So this is the model builder. Grab that section. It gives you the date and times. And that would be the starting for doing a basic site.

A couple of other things just to note. These are just the screenshots of what I was just showing in the video. So checking the values for the insertion points, making sure that the x- and y-coordinates are set correctly. Working in meters. And then the polygon you're selecting manually, make sure you've got those two ticked on. And then finally, the last one is to make sure that all the polylines are closed out.

Another site for data gathering, this is the cycling site, BBBike.org. A lot of our team was using this a while back to get the shapefiles for the buidling of the site. So you can go to the website and choose a location in the world, so it even goes as far to find Sydney, Australia. And we can choose that location. We want to get the Esri shapefile, and then download that. And you can make donations.

And there are several other-- It's going to work for me-- There's several other files that you can download as well, so depending on what software you're using. There are numerous file formats that you can download and reuse in your chosen software. So I'm just working with the shapefiles, and this is the zipped file that I'm going to get.

So the one I'm looking at is the shapefiles, but there's also various other file formats. And what you're seeing here is it's bringing down information on the buildings, places, railways, roads, all this information that could help build out the context of your city.

Laser scanning, we're quite lucky, we've got a guy at our office, Brett Casson, who's managed to get ahold of a laser scan, and he went down and actually scanned this site. For those who haven't seen or used laser scanning, it's incredibly powerful and accurate to grab a lot of information very quickly.

He went and scanned this site. Down at the bottom right here, you've get these mirror balls, like they're panorama photographs, showing the 360 of the site. And then when you go and open up it up in ReCap, you can do accurate measurements. It's a really powerful tool to capture a lot of information to build up your site context.

From here to check it, and it's real world location-- you need to reach to the scan so you can work with your survey to get this right. I can then reference this into Civil 3D. So what I'm doing

for a lot of this presentation is using Civil 3D as my sandbox, sort of bring everything in and just check it before taking it to InfraWorks.

So I've referenced that file in. And Civil 3D has a number of subscriptions add-ins. One of the ones here is being able to reuse that laser scan data to convert it into a toposurface. So for those of you who's used in Revit, there's this third party add-in to convert the laser scans to building information modeling components. But this is a workflow which allows you to convert it into topography.

So the recorder workflow got hid. You just go to your menu and find that subscription tool. Fire it up. What I want do is reference in my laser scan file here. You can put it in real world coordinates. I'm just putting it at 0,0 for the demo here.

So my laser scan-- and you clean it up in ReCap. If you want to, you can take out all the buildings and put things on the layers and just have the information you want. As a basic demo here, what I'm doing is I'm firing up this tool, giving it a name.

You can look at the different types of contours as well. So by default, it's between 2 and 10 meters. You can put it down to between 1 and 5. And then I'm using the simple tool to run the conversion of that laser scan into a meshing site here. So when I go and unload that xref, you'll now get a toposurface or a meshing file, which you can actually export out and reuse in Revit.

So for those of you on subscription and have access to Site Designer, you can export out from Civil 3D as a LandXML, and then bring this into Revit as a LandXML data.

So as we save this out and go into Revit. Go to Site Designer add-in and import that LandXML. You can do it by survey point. In this case, I'm just doing it by center.

And when I bring this information in, we now have a toposurface to work from. So that's from the survey's laser scan.

With all the data, you can actually use the map import to bring in all the data or the different files and stuff. In this case, I can just drag and drop. So all these different file sources, if they're set up in the real coordinates, you can just drag them into your application. They're going to sit in the right place.

So this is some of the data I've been gathering for this particular project. So the BBBike data

here, you can see there's like the yellow lines for the roads, the purple footprints for the buildings, the laser scan sitting in the middle of the site, the NearMap aerial imagery, and then there's also some information running under the city for the railway lines. So a lot of this has been free data that I've gathered and then used it to start building out the starting point for my city.

Working with SketchUp as well, so you can go and get buildings. There's a lot of buildings that have been loaded to the 3D warehouse. You can go and get these for free, check where they are in the world, and then bring them directly into Revit.

I'm not really a SketchUp user. I know you can export out as a DAE. You can bring SketchUp natively into InfraWorks, but the textures fall off. So if you're not SketchUp user, like myself, you can take these into Max, and when you import in a SketchUp file, it loads in all the textures for you. And then you can export it out as a DAE or an FBX file, which is going to hold or embed the textures, and then you can bring it into InfraWorks.

The other one is FormIt. This is one that we've been running for a couple years now. It's getting a lot of development happening. There's going to be a few new tools working with us. This way you can start massing up your model on an iPad, bringing in aerial imagery.

And then in this particular workflow, I've done the textures in Max. But you can take that into your InfraWorks site as your contextual environment. So the work flow I have here, for those who haven't seen FormIt, again, you're going to be picking your location in the world. So in this case, I'm choosing the Federal Bank of Australia, and just using some basic sketch tools, I can start to orientate the grid to match the orientation of the building. And then using the basic sketch tools to mass up the footprints.

I'm doing the typical extrudes and buildings. It's got snapping tools on it. It's a very simple, intuitive tool to use. I can use site reference photos to get an idea of what I'm building. And then finally finish off.

With this, you save it to the Cloud. It's a native axm file. It converts to an ivt fall, and an obj file, and it's sat file on the Cloud. And I can bring it into tools like Max where I just went on site and took some basic textures, tried out the textures in Autodesk Pixlr, and then I was able to save it out as a DAE and then bring it into my site. So that's one of the ways to make a really quick building, conceptual building for your site context.

The other one is trying to work out the heights. So you'll get the aerial image to work off, but you don't know the heights. So this is a site you can go to. It's itoworld.com. And the red footprints there are actually the sites with no height information. So don't have that much to go on here. I've got a few buildings noted in blue that I can get some height information on. If you don't have that information, you can use trigonometry. This is from the SketchUp website where you can start to work out or guesstimate the heights of the buildings.

Sometimes some of the data that you'll get from SketchUp won't be fully finished. So for the existing building that's going to be demolished on this site, it didn't have the base podium. So what I can do here inside of InfraWorks natively is start to build up the base, just by sketching around the base, and then using some of the site photos to texture map onto that building.

So here on the right is Autodesk Pixlr just for tidying up facade and just working out the skew.

And then also natively inside of InfraWorks is a little model building tool, which has a bit more 3D geometry in it so you can start to look at these formulas here to adjust the facade and as you create your own buildings. So there are numerous ways you can start to build up site contexts, and site contextual buildings inside the program.

So in this case, I just did a basic closed polyline tool inside of InfraWorks, and then used my repetitive site photo to just apply the texture to give me the base podium for that building.

So that's more or less a lot of the site gathering tools. What you want to do when you are starting InfraWorks for the first time, you're going to get a start up, a blank screen. You want to set up your model here.

So just take you through the steps. You're going to be locating everything to a folder, because it's going to start up with SQLite file to fire everything up, and it's going to pull all the data from different locations. So you want to put everything in one folder. Give it a name. You can give it a description. There's model extents. I can use some of the NearMap data that I've gathered for the model extents if I want to use those tools. And of course, remembering to get it in the right coordinate system. So that's really important, just making sure everything's going to come at the right location. You need to set that up.

And then finally, for myself, for everybody who drives in parts of the world, make sure you turn the driving lanes to the left-hand side. We drive on the left in Australia. And that's all you really need to do for the signing starting up the model here.

A couple of other things to note is that when you are bringing in different file formats, you need to go to the settings tool here and just go to Options, and make sure that the Navisworks and the Civil 3D information is turned on. And this is going to just support the file formats you're bringing in, like the Revit an Navisworks and AutoCAD applications. And over here, all the different file formats that you can natively bring into the application. And there's different variations of these file formats, as well. So it's a really good tool for bringing in a lot of data.

OK. And the last thing to note. I'll be showing this in the demo. This is the toolbar here for bringing in data sources. So we'll click on that, and I'll show you how to bring in various data sources into the application.

So this is all the data, just to recap again. So it's data from NearMap, the aerial imagery, the BBBike shapefiles, the point cloud data, the FormIt site contextual modeling, and SketchUp data. A couple things to note here, not all the data you're going to get from all these different sites is going to be set up to the coordinate system that you're working to, so the BBBike data actually works with the LL84, which is like the default coordinate system inside of InfraWorks. So you've just got to know when you bring in the data. You may have to try to test this a couple times, depending on where you get the data sources from.

Oops--

Over here, you've got the options to use a different coordinate system. So if it's not coming in the right location, maybe you got it from a different website that's not set up for the particular world coordinate system you're using, just test the coordinate system. Typically, LL84 works well.

The point cloud data, just got to make sure I'm working with the XY-M coordinate system. And just making sure that I'm checking the x,y,z coordinates if it's not perfect.

And then for FormIt and SketchUp, that's just interactive placing. So there's another tool down here. If you're just doing the early conceptual design models, you can just get away using interactive placing as opposed to worrying about the grid systems.

OK. So moving into design. I've just got to check on time. Moving to design, I'm going to start working with some of the tools, like Revit, for doing your authoring buildings, 3ds Max, the model building tools inside of InfraWorks, FormIt for doing our sketch design options, and then even bringing in some vegetation type models from Autodesk Seek.

So how many have used FormIt? This is a tool to watch. It works on an iPad. It works on an Android device. It works really well on the web browser. You can sketch design your options really quickly. There's more and more tools coming in here for in the future to be able to load in the textures and then download them with the textures. You can model up. You can do solo analysis. You can export it out as rvt file, and you can also download it natively as an obj.

So what I've got here is some basic verify views. So we're at the beginning of our project. Clients always want options. We need to work through three, five, seven different options, and we need to place them in our city context. So we've gone through the data gathering. We've got our site. We've got some views here. And we want to quickly sketch up some models on our iPad and then download them, and then use them inside of InfraWorks.

So this is the Revit model. We'll be coming back to this, but what I've done inside of InfraWorks is you can bookmark views. So you can see several views around the model, and you can load in your different design options and then flip between them very quickly.

So I've got tower one, tower two, tower three. Just as basic white SketchUp models, and even one here which I found an image of our CEO texture mapped to it. And we can go through, and we can click on all these different verified views, and then show them to other stakeholders, people in the community, planners, and then flip back to our Revit model. So it's a really quick way to start setting up your design options here, and then reviewing them inside of InfraWorks.

The next one is importing in the Revit data. So the SketchUp and the FormIt data, you're just going to interactively place it, but with the Revit data, what's key here is to set up the model properly with those real world coordinate systems. So this is where you're getting the data from the map grid of Australia, 56 GDA94.

A couple things to note here is that when you enter in those x, y, z coordinates, you do it in meters. If you try to do it in millimeters, it won't like it. And you can put in your rotation to true north, and the [INAUDIBLE] we're doing is duplicating and renaming the new coordinate system. And we can check this, again, inside of Civil 3D with a 2D export.

So whenever we're doing this, we're setting it up based on those real world coordinate systems, exporting out in meters, and using the shared coordinate system. And then we xref it into our Civil 3D site, we know that our Revit model's going to be sitting in exactly the right

location. So again, it's just another workflow to check that our Revit data's set up. And then we can go and import it using our real world coordinate system into InfraWorks 360.

A couple things to note. It is a conceptual design tool. If you try to bring in a really detailed model, you need to have a high spec machine. Sometimes, if you bring in too much detail-- When I first started doing this, I was bringing in spider clips for plan outside glazing. And you see here some of the data falls off. So just know if you've got a really high detailed model, that may happen.

But let's go back a little bit. There is actually a simplification tool here. So you can actually simplify the model. If it's too heavy, you can knock it down to say 50%. The other one is you could also run it through Navisworks. So Navisworks will read up to 56 different file formats. You can export it out as an FBX, and you can even use the tools inside of Navisworks here.

You can limit the polygon counting, so you can start to click on those and then reduce the file size if your machine is struggling with all the data.

OK. So with that, I'll try and get through a basic demo. And this is going to be one that I'll be doing in the labs tomorrow. We're going one again at 8:00 AM, I think InfraWorks, placing your Revit model inside of InfraWorks.

So what I've got here is a reasonable lightweight model, and in my site plan, this is going to be basic placing of the model. So I'm not going to be working with the northings and eastings here via the coordinate system, by the base point. I'm just going to do a workflow here where we're using the location, the real world location. And this one is for a site in New York, which I'll be doing tomorrow.

And what I'm going to do is just use the little home placement point here to locate it in a real world location. If you try and go the other way with a real world coordinate system and you don't know the coordinate system perfectly, then when I was trying to do this without knowing it perfectly, I ended up in the river a little bit. So this is just another way to get around it.

So I'm just going to place this on my site. It's giving me the x- and y-coordinates here. I'm just going to go OK. And I can export this out-- Sorry. Just save that model, because it reads natively inside of InfraWorks. So I'll just go to InfraWorks now. And we'll just get out of the Star Wars model. We'll come back to that.

So what you've got just with the main interface, you can do model builders here. And you can

pick your location. You can use that shapefile, the Esri shapefile to set up your side boundaries in the real location. I've already got one that I've set up using this process. So I just chose that New York site, which is this one here. I've loaded a little bit of SketchUp data.

It doesn't take that long to actually build it. It only takes a few minutes to gather the information from open street maps on the Cloud. For those of you who are Revit users and haven't used InfraWorks before, the buttons are kind of a little bit back to front. So panning is my right mouse button and orbiting around the site is my left.

If your model is going a little bit slow, if you've got a really detailed model, you can go here to the settings under the hood here. And you can see this getting a little bit slow. Go to visual effects, and turn off high visual quality. You can even turn on wireframe, if you want. Is that going to do it? Oops, that was animation. So you can even turn on wireframe if you want, and it should move a little bit faster. So I'll just leave all these settings off. There's field of views, brightness and contrast, light intensity. Typically, just leave these standard just for now.

So what we've got is our site. I can model around really quickly. This is that the Revit model that I've located in the site. I'm just going to delete that out for a second. And what you'll also notice, if I just go down into the site. This is the aerial imagery that comes with the model builder. It's OK, but if you want more detailed data-- I was using the NearMap aerial imagery-- when you go and turn back on the animation and the high quality, you'll start to see reflections on the water, and you see the water's starting to animate a little bit there. So that's why it may be slowing your machine down if you turn those on.

So when starting in a lot of Autodesk applications, you always tend to work from left to right. So this is going to be our first tab, the orange eye. And we're going to go to data sources. And what I'm going to do here is natively just bring in the Revit model directly.

You can bring in 3D models. There's other file exports. So it could be a DAE, a DXF, FBX, obj. But this one allows you to do the Revit directly.

So if I just go to Autodesk Revit. And I need to go to my file where I saved it. I'm trying to remember where I saved it. So bear with me. It is-- I'm doing about five papers at this AU, so just trying to remember where I've filed everything is always a bit of a difficulty. So this is the labs model I'm going to use. Make sure I use the labs one. And I'll just grab that one. OK.

So this is the one that's set up. So we used the internet mapping service to locate it in the right

real world coordinate. So what it's doing is it's connected to the data sources. Depending on the size of the model, it could take a little bit longer. If you want to do this faster, if you're just doing interactive placing, it might be quicker just to export it out as an FBX file as opposed to having to do the conversion.

So depending on the files that you bring in, and if you're bringing them in natively, it could take a little bit of time just to convert it. The other way to do it from Revit is just to go to your 3D view, and export it out and an FBX can be exported out.

For those who haven't used the FBXs, it's going to embed the texture imagery as well. And then sometimes if you use the FBX and link it to tools, like 3ds Max or Showcase, what it'll do is it'll take the cameras and the lighting for your models as well. So all this data is going to transfer through for you to use inside your application.

So let's go back to InfraWorks. Now, we've got the tower inside the model, but it's not appearing. So you've got to configure that data. So if I just double click on the New York tower, and this one, I'm just going to leave it on the default settings. What I found here, though, because I was working in the US. I typically work with the XY-M set up. Here you want to work with the FT, the [INAUDIBLE] set up.

And I want to do center 2D. Go to 3D model. Flick around here. Check the model. This one I've actually simplified a little bit. So I just go down and zoom into the data. It's reasonable clean. You can see the textures or the colors that I've set up in the model are coming through. I could simplify the model if I want. I could add [INAUDIBLE] of information.

I'm just going to go through and do close and refresh. So I haven't done interactive placing. And what this should do, hopefully, if live demos-- live demos never work perfectly. But this should come in in the right location.

So it's just doing a quick refresh. Yes. OK. So that's a simple way to bring it in just based on point and shoot. It's come in the right location.

The only thing it hasn't done for me is it's facing the wrong way. So if it doesn't work quite right, you can actually edit it, and then rotate it here. You can type in 180. Or you can just double click on the data source here, and just rotate 180, and go close and refresh, and that will come in right. So that's a quick easy way to bring the data from Revit into InfraWorks 360, and then have it locate in the right location on your site.

You can see it's just processing. Thinking, thinking, thinking. OK. So now we have our dataset from Revit inside of InfraWorks. OK.

The next part of the presentation is starting to look at landscaping, landscaping and hardscaping. So I was kind of inspired by the Millennium Park in Chicago. And I really like this water fountain. So I thought I'd create a water fountain with our CEO's face here. Didn't know whose face to put on it.

So what I've got here is just a basic work flow inside of 3ds Max. It's a really simple, easy modeling tool. Max is really easy to get the texture mapping right. So what I can do is I can just sketch up a box, add a bit of detail to the outside, and then you've got these simple tools here for doing the UVW type mapping inside of Max, and then applying that to the fountain.

I haven't quite worked out how to do the water properly. I'm pretty sure I've got to animate it one day. But again, you can just import that in. Natively, it's an FBX or a DAE file export. And it's going to load into InfraWorks, and you've got your replication of the Millennium Park water sculpture.

The other one I really like to use is Max for modeling. You could just do this in SketchUp or you can do it in Revit. I like Max because it's really fast. I can quickly make some street furniture, drag and drop in some textures, and then add this to my InfraWorks library here.

So you can bring it in the same way as what you brought in, say the Revit models, before you can go an load it in. Or you can add it to your library. So you can start to add all these components, adjust them, scale, rotate them, and just bring in some of that street hardscaping information.

Inside of InfraWorks, as well, is really good tools for doing road design. So I'm not a road designer, but I can intuitively work my way through this tool, which allows you to set up the roadway, the curbs, the [INAUDIBLE], the sidewalks, and also load in all the street furniture, and then place them at different varying distances around the-- with formula around that road. And then as they go and point and shoot to create their road in the model, all those items are going to populate. So it could be all the street furniture. There's some native models inside the package, like this house. And then you get all this other street furniture coming in as well.

All you can do with your data is just is either create a new folder to load it in or you can just start adding in all your own hardscaping information into the menu here to start using for

building up your site furniture.

The one here I wanted to show-- How many 3ds Max users are in the room? A couple. Cool. OK. And how many have used Populate? A couple.

So Populate was called Project Geppetto a few years ago. It was like and add in for Labs that's now part of Max. I think the newest release this year, you can put cowboy hats on the people and have them holding phones.

This is just the basic workflow where you can do the street furniture and then place people sitting, talking, walking, and then take it into InfraWorks. Another thing you could do if you want to be really creative is replace your face, like texture map your own face in there and freak your client out. You can start to unwrap those texture maps and then add your own faces.

If you want to go a little bit further, we have on the Autodesk Knowledge Network, there's thousands of free 3ds Max pre-rigged files to work with. I wanted to show this one because not all the data goes through from 3ds Max to InfraWorks. However, some does.

So this is one of the simple ones. It's a pre-rigged animation of a butterfly. It's got 300 frames, and all it is, there's a little sort of helper here. I can just hide that selection. What we can do is when we go to play it, it's all ready to go. It's all flapping around. The one that I've shown in the other scenes is like a whole scene of butterflies. If you want to get poetic, you can start to do that.

With this file, the simple workflow is to export selected. And we just do it as a DAE file. That's going to hold a little bit of the animation. Just make sure you've got Bake Animation turned on. Ignore those.

And then inside of InfraWorks, if we want to bring a butterfly or any other animated component into our model, we can just go here to grab that information. So it was 0, 1, open, and then when we go to configure it. So I'm just going to add this as city furniture. What you'll see now is the actual item animating.

So if it's more complex, sometimes it doesn't work. But the simple ones do actually go through. So you'll see some of the things that don't work with people. This is just another example of how you can bring in those items. I'm not going to put it on a real world coordinate system. I'm just going to interactively place it. And let's see where it is. There it is.

So I can go and double click here. Close and refresh. And at the moment, I don't think the animation is turned on. So when we go to turn on the animation inside of the application, we should somewhere see that butterfly coming in.

Has it gone missing? We'll have to come back to that. Maybe I've located the wrong location. If you ever get things in the wrong location, just go to interactive placing. Here we go. Just center the 2D origin. There it is.

So now we have a pre-rigged butterfly coming in to land. So you don't have to put butterflies in your model, but that's just the simple, simple principle of bringing it in. And it just repeats those frames.

OK. So if you need to get those, again, it's from the Autodesk Knowledge Network. There are thousands of pre-rigged scenes. There's cockroaches coming out of a pipe and stuff, a lot of fun, and you can just load them in natively. You don't have to do too much to them.

So this is the recording of the populate people. There's even been some newer releases where you can start to fine tune their faces. We're just placing people on seats and walking around. Inside the application, they're rigged. So they've got like the bones to actually rig their arms and everything.

When you export them out as a DAE file to use inside of InfraWorks, it's not perfect. It doesn't hold the character rigging. One of my colleagues at Autodesk, Dave [INAUDIBLE], has actually written a script to do character rigging if you want to have people walking with the arms. This one, when you go to bring it in, they kind of look a little bit drunk, or they're a bit more like *Team America* type puppets. So just take it as it is.

But when you go and interactively place them, they will come in. And you can see here, and we've placed them in the lobby. Someone's already fallen off their seat. But you place them in the lobby, we go back to turn on the visual effects, and that's how they come through. So from a distance, they look OK. If you're getting a little more detailed, they're a little bit off. And I think this is the butterfly again, landing on that guy's head.

So back into Max, just to show you a basic demo on how to do a bit more with this, like customizing the info. So one of the ones here just with the *Star Wars* theme. I was looking at doing a TIE fighter. So I've got some people here. This is just using the same principle as before. You just go and draw that item there, simulate, and that should simulate, and then just

go play. And now, they're all rigged, ready to go.

If you want to do more stuff with them, you can select one of these characters, [INAUDIBLE] selected. You'll now start to see that the rigging is available here. So you can go and grab that rigging. And then, pull this guy's arm up. Maybe-- I don't know. Grab that leg. This [INAUDIBLE] with the legs. Depending on how they're rigged. And there's a new pose. And now, he'll start to move with that weird foot, and then like so.

So there's a lot of things you can do, if you, you know-- a lot of fun.

So what about here? You can do this with cars, people, whatever you're going to work with. I've got a TIE fighter. And with this TIE fighter, it's a reasonably light model. Let me just bring this up. And I'll just use. [INAUDIBLE] easy to see.

So with that TIE fighter, it's a reasonably light model. And what I want to do is have it flying along a path. So if I go to my top view here, and I've just got a few paths here that I've created before. If I just go and play that, you'll see the TIE fighter is always going to follow its line.

Let's say you've got car, vehicles, whatever you want to have follow a path. We just go to our sketch tool here. The line tool, I'm just going to use the corner for the smoothing type, and I'm going to drag a shape here, and go to my modifier stack, and just move some of the splines around, so a really simple easy tool for you to have a path for your TIE fighter or your car.

And then with that object selected, we've got animation tools inside of Max. There's several different ways to do this. And then when you first see Max, it can look a bit complex. But you can usually find a lot of the tools here on the top or in the modifier or motion stack.

I'm just going to use the basic animation tool here where I want to do a constraint. So I'm just constraining the TIE fighter to this path. I just go path constraint, and it gives me this little point and shoot tool. And now that's attached to the path.

To get it to align with the path-- So at the moment, it's sort of flying on a bit of an odd angle here. So I want to go to the motion controller. So where are we? Where are we? Where are we? I want to go to select that TIE fighter. Go to motion. It's not giving me my motion. OK. That's kind of something new. Let me go to the other one here. Oh, sorry, position.

So if you go to the position of that TIE fighter, it's going to give you a couple tools here. These are the things that we've constrained the TIE fighter to. We want to make sure that we've

turned on a couple things. And you can experiment with these. We're just going to go follow, and we're going to have it along the y-axis, and we're going to flip it. And what you'll see here, now it's sort of facing the right sort of way. So when we go to run along that path, it's always going to follow that consistent path.

So really reasonably simple work flow here to start doing this. And then when you want to explore it out, you don't need to grab everything. You can just grab the one object, and we'll go through export, selected. And we'll go TIE.

Make sure it's a DAE file. That's the one that's going to contain the animation information. Save, make sure that's turned on. And then back to InfraWorks, and just repeating that work flow.

The other one is sometimes, if the scale is not quite right, you can still just rescale it inside of InfraWorks. So the TIE fighter, let's just see where it's coming in. And I may have just got it up a little bit. Can I see it yet? Has it vanished on me?

If things do disappear, sometimes they may be completely out of the way, what you can do is you can go to your basic set up here. Go to your-- Where is it?-- your models inside your data sources, and then right click on that TIE Fighter. And I haven't configured it. Interactive placing.

All type, sorry. I don't know what time in the morning it is for me based on Australian time. Yeah, I need to get my third double espresso of the morning. So interactive placing type. So if for example you can't see it, you can also use these other tools to find it.

So I'll just go close and refresh. So now it's been set for the type, but we can't exactly see it. You can right click on it and go select features. And then with the bottom here, you can go zoom to selected. And you can see here it's far too big. So this is where you can go and double click on it again. And this is just because I got the model from a different data source. The Autodesk global team loaned me a lot of the data from various places. And you can start to scale down and move it around. So again, if I just select features, zoom to selected, we now should be starting to see it somewhere in the model.

If you ever get lost with navigation as well, you can use like the gaming keys for navigating. So it's you're W, S to move up and down, left and right, and then the arrows. So if you're not liking the mouse tools, you can use the gaming keys to find the item.

So somewhere in here, there's a TIE Fighter, but we'll have to come back to that, I think.

So that's a simple work flow. So just to stay on time. There's a few other softscaping tools you can use.

So this is bringing in trees that are natively embedded in the project. For those of you who have like used trees before, you get the RPC trees in Revit, when you're trying to use trees in Max, you've got to convert the proxies. They're really heavy. Inside of InfraWorks, they're incredibly fast. You can load in thousands of trees with all the leaves, all the details, and InfraWorks is kind of like a gaming engine. It's going to perform really fast with that information.

The other thing we can do is if you want to randomize trees, so when you go to do your tree tool, you just draw a polyline, and close it off, and then you place all your trees, but they're all the same. You can set up these tools which allow you to create a randomized tool. And you can load in the probability of all the different trees, work out what types you want to have, and then just load them into the properties here, and you're going to be able to randomize the displays of the trees in the model. So you don't need to go and manually set this up.

The thing that I get a lot from customers is with certain tools, like you start to see the tiling of the textures, so recently we bought out the seamless texturing for the grass inside of InfraWorks. So you can load this in and do the coverage for your grass areas.

And then, in Australia, a lot of people are asking, where are all the Australian trees? So we have on Autodesk Seek, there's actually 3ds Max data. I know it's like predominately Revit. But you can go to the xfrog trees, and they donated 32 trees that you can download. So just open them in Max. Save them as an FBX, and you can use those trees inside InfraWorks.

OK. So that's all the design, the hardscape, the softscape, bringing your Revit models, TIE Fighter, and what we're going to do now is move into the last 40 minutes on the analysis and the presentation. And this is starting to add some of the tools that maybe InfraWorks doesn't have quite yet, like text, so animated text. Bringing in cars, so inside of Max, you've got an add-in called Civil View, which allows you to set up your cars, and you can set them up to drive at speeds or kilometers around the city.

Doing some basic shadow analysis in Autodesk Pixlr, just like doing overlays to show the percentage of the shadows cast by the buildings. Flow Design, bringing the FPX data into Flow

Design and doing the wind/wake analysis around the perimeter of the building. And then finally, the animation, the fruit of your labor, producing the final animation in InfraWorks Presentations.

So this is animated text. I saw a presentation on this online for AU last year when someone did this in AutoCAD, and it took a long time. I'd recommend using the Max tool. It's really simple to use.

This is going one step further and doing spinning animated text. So inside of Max, inside the basic spline-type tool, you've got a text application. There's even a newer one that's come out in the latest 2016 release.

What we can do is we can draw our text, extrude it up, and then drag and drop a particular material that we want for our text. We rotate it. So simple tools, using the xyz gizmo to rotate it. And then-- at the moment, it's not animated. I can set it up for, say, 300, 600 frames, and just click the autokey button and then have this spin round 360 degrees.

So make sure you've got the autokey button. You set it out. Take it to the end for the last frame. Spin it 360, and now we have some spinning text. So from here, we just export it out again as a DAE, and then we're going to place it in our site next to [INAUDIBLE] and our animated people. We check it, centering it at the 2D, and then we have some 3D text.

So that's really helpful if you're wanting to orientate your clients around the site. This is a name placeholder, something that InfraWorks doesn't do at the moment, but it's a really simple way to start populating your streets with street names.

The next one is with cars. So this is an add-in for Max. You've got to install it. It's called the Civil View application. And what you can do here is you can bring in a spline from your chosen authoring application, and then apply vehicles to it.

You can also set it up so it's rigged with the right type of textures to go into InfraWorks. Max works with a mental ray rendering engine, same as Revit. The ray tracer engine is inside of InfraWorks, so sometimes you'll bring textures through from the authoring tools, and they may not look quite right. This is a third party script which will go through and take all the textures inside of Max and then convert them into ray tracer or scanline type textures so they'll look better inside of InfraWorks.

So the work flow here is similar to what I was trying to do with the TIE fighter. We've got a shapefile. So this is just a shapefile from the InfraWorks model showing the perimeter of the road going around the site. I'm going to use the OPS tool to load in some cars. There's a great database of numerous cars that you can use here.

You load them in. You set the count of cars. You set the speed. So I'm working at 50 kilometers per hour. And then you go and run that tool, and it's automatically going to place numerous cars on that spline for you. So a really simple work flow here to start adding vehicles to your buildings. And you can do this with anything.

And then check timeliner. What it does is it adds all the frames. It calculates it for you as well. So you don't have to go and put in 300 frames. It will automatically calculate it. So it's got like 1600 frames, so the cars are going at the right speed. And with that, just running that script to get the textures right, exporting it out. We can then export it out and place it inside of InfraWorks. And these are the results you're going to get. So it's going to come in with the right sort of textures. You turn the animation on, and you're going to see the cars moving.

The next part is the shadow overlay. So you've got all your textures from your buildings. You've got your textures from NearMap, but you can actually add a terrain feature style here. So if I just want to have like a basic white model, and I want to look at the shadows being cast by my different design options. So when we brought in those FormIt design options at the beginning, and we want to see the shadows that have been cast, we can set it up for different times of the year.

So in this particular site, the concern was with this new tower, it was going to cast a lot of shadows over Martin Place at certain times of the year and summer and in winter. We can do these different studies here. So option one is looking at 12:00 to 3:00 PM in April. We can load it in, and we can start to see the shadows being cast. Probably a little better with the winter diagram here. We can start to see the shadows, all the different options being cast on the park.

And then with the terrain themes and the output, we can then take it into Autodesk Pixlr, and with Pixlr, we can start to add layers and then start to see the differences between option one and option two. So a really simple tool. It's got a very similar interface and hotkeys to Photoshop. But it's a free application on the Cloud that you can use.

And then for the wind/wake tools, from InfraWorks, you can export out as FBX file format, so

you can grab certain parts of the city or the entire model. You can send this data out as the FBX, and you can load it into the Autodesk Flow Design tool.

What I'd note here is don't bring in all the trees. Like all the trees were great inside of InfraWorks, but if you try and bring all the trees and the vertices into the Flow Design, it's really going to slow your model down.

So we're going to bring it in. I've made the model a little bit smaller, but if you want to get more accuracy in terms of analyzing wind/wake flow patterns, you'd want to use a much larger model. So when the winds coming, maybe if it's coming in off the water or coming over a park, it starts to pick up a little bit of turbulence and then hits the buildings, that's more accurate work flows in the space.

There's simple tools here to set the flow line settings. So there's the speed, size, the length. And these are the displays you can get. So I typically set it up for like 10 meters per second for the velocity, for the flow lines. And then you can run these tools either as flow lines or even iso surfaces. I think this is more for internal spaces.

And you can start to adjust the graphics here as well. So there's kind of the pseudo color overlay where you can see you've got your high wind pressures here denoted by yellow and then the lower ones, by the purply blue color. And you're seeing all the winds coming off the parks here and how it's hitting the higher towers and where the higher pressures are.

So with that, there's a tool that allows you to export animations or video AVIs directly from the application. You don't need to Camtasia it. And the longer you leave it, the more accurate your city is going to be. It doesn't have to be perfect. This may just be for a conceptual design. For those of you who have been or live in London, the walkie talkie building I've heard is convex, and it's starting to pick up speed and blow people off their feet. So this is a good tool to actually test curved buildings before you actually go and build them and see what the wind pressures are like beyond that curve.

So finally down to the fun part. This is the storyboard tool. And we're actually doing OK for time, so I can actually go a bit longer on this. There's a number things you can add to the storyboard application. How many people have used Showcase? Just a couple.

So Showcase and InfraWorks have this really simple tool for doing animations. You can just drag and drop screen captures, set up certain points, and it'll start to stitch together the

animation for you and produce the animation in minutes. Back in the day when we used to try to do it in Max, it would take days or weeks to render our all the frames. This one, we can get our animations in real time. You don't need to do rendering.

The one I've got here is the sun path. So if you need to do a quick sun path, you can animate it inside of InfraWorks. So just bring in your data, and then set up the times here, so January, April. And it'll run the sun path from 7:00 AM to 7:00 PM, and then animate the shadows being cast on the site.

The other one, this is the simple animation presets. So you don't even need to set these up yourself. You can start to work some of the basic settings for crane rigging, sort of moving around, 360 animations. And this is going to be the basic demo on how to start doing that.

So with the interface, over here you've got all your tools for doing your authoring, of course, and doing some sort of analysis, so the ones like the terrain themes or doing the shadow overlays can be found over here.

This is the key one here for doing the output. This is the storyboard creator. So I'm just going to close out these tabs here for now and bring up the storyboard creator. And you're going to get this simple storyboard interface here for doing your screenshots and then linking the animations between them.

So I've got one here that I've done already, and this is just moving from point A to point B. If we do a new one, so whenever you create a new one, just go and do new storyboard.

We can rename it. So just double click and give it a name. And we want to do, say, a basic animation, maybe just flying around the city. So we can go to a start point, go and drop down this little magnifying glass here, and do a look around, maybe an Alba animation. And we'll just hit play, and we're automatically spinning around the site.

Now, it's gone inside a building. We don't necessarily want this. So we just want to fine tune it a little bit, so I'll just go out a little bit. And I'm going to do two things. First, I'm going to reset the start point. So I'll just reset it, and you'll see the thumbnail updates.

And then, I want to add a bit more time here. So starting at 0, I want to go up to maybe 12 seconds. So I'll just increase it. And you can see it increasing in the timeline. And it's going to angle right instead of left, and I'll go 360 degrees. And then I want to go down, say 45, 45. And that's all you need to do. And you can just test this. Now, this is going to spin around your

model.

You see one of the tower's disappeared? So to deal with that, this is something I found just recently. I was wondering, why are my towers disappearing when I do this? You can go here to your model explorer, and it's something that's not highlighted that well. You can actually add the level of detail. So if this isn't turned on, it will kind of jump out. So when you go further back-- It's kind of like a gaming engine. It only reveals the information as you need it. So when I go and do the buildings, and actually turn this item on. So you can turn on layers and all the rest. And we just go and run that storyboard again. Hopefully--

Oh, there's my TIE fighter. All right, it made it.

So now when we're spinning around, now that we've turned on LOD, the buildings aren't dropping out. So if you ever have things drop out, just make sure you click on these little building boxes here, and it will show that information. It will reveal that information.

The next one we can do just to show you the sun path. So I'm just going to go to the storyboard, visual effects. Turn on high visual quality to start showing my shadows. If you want to fine tune your shadows just to see the date and time, you can start to drag this along. It's slowing down just a little bit, probably because I'm pushing the graphics card a little bit.

Let's turn off visual effects. And just turn off the animated TIE fighter for a second.

And I'll go back to sun and sky. This is where you're going to be able to adjust the date and time. So you can see here, maybe midday is going to give us less shadows. We can take this to, say, middle of the year.

There's also a couple of other tools here for cloud and wind cover. So if I just spin around, it's a nice sunny day. It's really starting to struggle for me at the moment. It's a nice sunny day. But you can start to turn up the wind direction and the wind speed and then the cloud cover, because you've got to have clouds to be able see it. And then when you turn back on your animation tool, the clouds will start to animate as well for you.

Is that coming through OK there?

So there's a number of tools there that are preset ready to go. When you want to do this as a shadow analysis-- So I'll just go to my view cube here. Go to my top view. It's always doing stuff in-- It's always doing the presentation perspective. It's not going to be an orthogonal type

view. So I'll do our perspective here.

This is the bookmark tool that I was showing before when we had the verify type views. So I'll just go and add a new view. Double click on it to give it a name. And it's probably a little bit slow. It's going to move that.

And then from here, we can do our sun path shadow study. So we can go and do an add date and time animation.

This is really going slow for me today-- And I'll just go and crank this up-- probably because I've got a few too many programs on. So I'm finished with Max for the day. So I'll save that. We're finished with Revit. We'll just get rid of that.

So we go and crank up that time of day, start time, and then just hit play, and that should be playing. And now you're going to see the shadows start to for you.

And then to take that out, you can just go and click on the record button, and you can save that out as a compressed video, save it to your location, adjust the frame, set the resolution.

And you can even do the export selection from certain times to end times. So this could help if you just wanted to capture a part of the storyboard and not the whole thing. It could save you a lot of time if you're pushed for time. So I'll just cancel out of that, and I'm just going to turn off the high visual settings here. And just do a basic animation through the city.

So let's move to this location here, use the arrow keys. I use the W, S keys to angle up, angle down. And to do this animation, I'm just going to delete that one. And I didn't [INAUDIBLE].

Another good tip here is to whenever you're starting it, just always bookmark it. Because sometimes you can go and add a new storyboard tool, and you'll get lost. It will take you to like another default location.

So here I'm just going to do the very simple camera path animation. So frame one, and I'll add another key frame and another key frame. And what we can do when we go to those different key frames inside of the storyboard tool, we can zoom into a new location. So maybe I want to be up here and looking down. Looking down at the butterfly. And then you can go and reset that view. Go to the third key frame, and then go down to, maybe, down to the bottom of the site.

If you want to go straight to a building, you can just double click on it, and it'll take you straight to that building. Because this one was created on model builder, actually when you select it, it gives you a little annotation overlay. Well, it did before. It was just saying it was one of the Trade Center buildings. But that'll be our finish point, and I'm just going to reset. So there's, say, 10 seconds of animation, and now when we go to run that animation, it will go up, hopefully avoid the TIE fighter, and then find the shortest distance to that view.

And then simply to finish this off and then save it out as an AVI, I'm just going to turn on the visual effects. Animation turn on. There we go. And then just hit record. I typically use the compress-- the MJP compressor. 25 frames per second is adequate. Or if you want to get more accurate output, you could go for a much higher setting, like up to 60 frames per second. And let's save it as a default name there.

And then you can use the view port resolution or you can set the resolution. Typically, what's a good one that I like to use. Maybe they're going higher than this. Unless you wanted to do really high definition is 1280 by 720. And then I just want to do the basic export. So I want to go here and just do it from 12 seconds to the last frame. And we'll do that.

And now when we go to record this, it's going to record it incredibly quickly in real time, and we're going to have an animation. So what I've actually done, before I show that the final video coming up, is created a number of these to put together the last presentation. I haven't done all as one recording. If you try and do it all as one recording, it can get a bit tricky, because it kind of feels like you're on a roller coaster.

So this was some of the videos that I put together. The one I'm going to show in a second, which is different parts to the model, and you can play around with some of these settings to have it work in this case. I've got a sand crawler.

I'm not doing too much with the camera. I'm not like trying to go from point A to point B to point C. I'm just letting the DAE animation play. I'm just moving the camera really subtly. And what's come up? A bit of music from before.

So there's all these different tools, all these different ways that you can set it up, and it's just creating the video. It's taking a little bit longer. I think it's possibly my graphics card struggling a little bit. So with that, I'll just cancel out of that just for the sake of time. And just go to the last, last bit here.

So this is that the final result, and there's a bit of noise with it, just showing all the tools that I've gone over before.

Yeah, OK. Yeah, the walking people don't move their legs.

That's a laser scan.

So that was a little bit of fun towards the end there, but with all of that, you can start to get out some OK presentations. I've got a question.

AUDIENCE: Do you have any methods for putting a [INAUDIBLE].

SAMUEL MACALISTER: So the context for--

AUDIENCE: --the roads [INAUDIBLE] stuff around them.

SAMUEL MACALISTER: Yeah, yeah, yeah, we can go into-- So because I've finished a little bit ahead of time, we can start doing some Q & A and do some questions. So with the application here, inside the tool for the roads-- And I'm just going to turn down visual effects a little bit. It's going very slow today.

So here, these are the roads that have been pulled down from model builder, and when I hover over some of those roads, and just go and select to them, you can see here it's created, by default, some curves, some [INAUDIBLE], the main road. Here within the properties of the road, it's going to bring out the rule style here. So if I wanted to change it to another style, I can go and click on that road. And by default in the application, you have all these different roads you can go for. So maybe it's a boulevard. I can go OK. Turn on your auto update. And it will place this new road style, which has it populated with trees. It's a really simple way to work with the default road settings.

There's other ones here where you can edit, say, overhead passes. So you can start to pull up the heights, and these will start to update automatically.

And then if you want to create your own one from scratch, so if I just go and choose this road here, and I want to create my own type of road, we can go to our style palette.

And then the style palette, this is going to give you access to all the libraries and the components that you have. So if I go down here to roads, and I want to create a new road, this

is going to be the interface that you're going to start with. So I'll start with, maybe, one of the more detailed ones and just work out from there. So I'll just duplicate that file. And I won't bother changing the name.

And what you can do here is you can start to add in different components for curbs and sidewalks. You can also add in different decorations. So if I want to add some different decorations to the curb, I can go here and then bring in different items from my library. So maybe a traffic barrier and a traffic light.

And you see in real time, they're populating on my model. Now, at the moment by default, they're pretty close, like, that probably wouldn't work. So we can also look at our spacing, and we can make those, say, 30 or 50 meters apart. That cone, we can make them, say, 2 meters apart, and instantly we've got these located where we want to have them.

We can also have spacing offsets. So I'll use track offset. And simply now we've got a road style here, and we can go OK. And we'll let that populate. So that one hasn't populate yet. All you need to do now is just drag and drop it onto the road you want to place, and now it updates it with [INAUDIBLE].

Was that correct for the--

AUDIENCE: [INAUDIBLE] highways, and yet the highways are coming [INAUDIBLE].

SAMUEL MACALISTER: Oh.

AUDIENCE: [INAUDIBLE]

SAMUEL MACALISTER: Yeah. So the full vision has more tools for traffic analysis. So this is where you would be able to start getting more into your road designs. Because I'm not sort of from that side of the business, I wouldn't be able to go into too much detail on that. But you can load in more advanced roads, and there are different types of connectors and roundabouts, and then there's a tool we acquired from a company called Commuter, which starts to do traffic analysis, and it will start to simulate the cars for you automatically. But that's in the full version.

Yep.

AUDIENCE: Can you just repeat what you said about not being able capture [INAUDIBLE].

SAMUEL MACALISTER: Not being able-- Oh, not being able to capture the legs moving? Yeah, so what you have here inside of Max, like when we saw the video before, the people looked like they're on roller skates. The way to be able to get around that, and I'll just bring this up on Google.

So one of our Autodesk colleagues, Dave [INAUDIBLE], has done a really cool-- In fact, I've got a lot of bookmarks here. I should have his page. If you do want to animate it, he's written a script. So Dave is from the plant, and mining and oil and gas industry. And what he's been doing here is looking at the people. Instead of having them on roller skates, you can go here, and you can use his script to animate the people. So he's got a work flow recording. You can download it, and it shows you the script. It doesn't do the texture mapping of the people's faces though. It's more of a basic sort of a character here. So I'll just see if he's got a screenshot of it.

AUDIENCE: So you can't get for example the populated with [INAUDIBLE] motion? [INAUDIBLE] Max. You can't bring those--

SAMUEL MACALISTER: You can bring--

AUDIENCE: Do they have walk cycles [INAUDIBLE]

SAMUEL MACALISTER: They have walk cycles inside of Max. But InfraWorks doesn't do that directly. It doesn't allow you to take the rigging of those characters in. The way to do would be to look at Dave's site and get the script here, and then run the script and that will populate the people.

Yeah, at the moment if you just do it by default, they'll come in looking a little bit odd.

So yeah, still open for Q&A, but just to summarize what we've gone through, for just as a recap, the data sources, trying to set up everything with InfraWorks with Civil 3D, just to make sure everything's in the right real world location, the NearMap sites, the BBBike for the shapefiles, conceptual design in FormIt, and then the laser scan work flows, the different design tools, again, FormIt, the tower design in Revit, either using interactive placing or using the internet mapping, or the real world set up, furniture in Max, the populate people, and then the softscape with the trees from Autodesk Seek, and then finally, the presentation with the animated text, the cars in Civil View, Pixlr on the cloud, Flow Design, and 360 for the final presentation.

So I think I finished a little bit ahead of time, 10 minutes. So we can either do more Q&A or if you guys want to get some coffee and wake up, we can use that. OK. We're going to finish it there, and thank you very much for coming.