ERIC CHAPPELL: This class is "What's Beyond InfraWorks 360 LT?" My name's Eric Chappell, Community Evangelist for InfraWorks 360. I work for Autodesk.

I've been with Autodesk for about two years, started off in support. And I've always had a great love for InfraWorks, so it was kind of natural for me, when an opportunity opened up to do something specifically with that product, for me to take it. So I have a super, super fun job.

And just going out there and talking to people about this product that I really do love, kind of staked my whole career on it. Wrote books about it. So it's obviously something I'm excited about.

Our learning objectives for today. I'm assuming that some of you have InfraWorks 360 LT and you're interested in knowing what else is out there, and that's why you're here. That's what we're going to cover. I want to be able to explain to you what the differences are, so that you understand maybe what you have and what you could have.

And then we're going to talk about the three major verticals. In addition to some of the collaboration and publishing features that are with InfraWorks 360, not the LT product. So that's what we're going to dig into and really get a deep understanding of what's out there. What you can do.

And I think you'll be happy to know, most of this class is going to be demonstration. Very little PowerPoint. I'm going to welcome questions as I'm working through the software. I don't have any really structured script I'm going to go through. I'm just going to go through the features and show you what they do. So feel free to ask questions.

Our agenda. Which InfraWorks is which? InfraWorks 360 LT versus InfraWorks 360. Then we're going to look at the key InfraWorks 360 features. Model Builder and Collaboration, and the Vertical Applications as I mentioned. And then we'll talk a little bit about preview features as well.

So first off, a couple of slides to get started and then we'll really get into this. So there are two flavors, I'll call them, of InfraWorks out there. There is in InfraWorks 360 LT, you can call that a stripped down, or basic version, of InfraWorks 360. You're familiar with AutoCAD LT versus full AutoCAD. There are definitely feature limitations in the LT version.

Most people have the LT version as part of a suite. Infrastructure Design Suite Ultimate, or Premium, and Building Design Suite Ultimate. Who has InfraWorks 360 LT? All right. Looks like a good, at least, half of you. And just nod your head, is that part of a suite? Is that why you have it? OK. So that's the common scenario.

You can buy it by itself, but most people, they have it as a consequence of owning a suite. So it's a Desktop subscription entitlement. So that means, not only do you have to have Infrastructure Design Suite, it has to be on subscription for you to be entitled to that LT version.

InfraWorks 360 has in it, everything that is in InfraWorks 360 LT plus the Model Builder and Collaboration tools, some simulation and analysis and then other things as well. And then we've got the ability to add on the vertical applications of drainage, bridge, and road. And whatever other future verticals we come up with in the future.

So that's a capability in itself. Something that InfraWorks 360 LT cannot do is accept those vertical applications. So if you're on InfraWorks 360 LT and you want to run the Road vertical, you have to upgrade first to InfraWorks 360, and then add on the Road vertical. So you're paying for one thing, and then another thing, if you're looking at it from a cost standpoint.

And that's often what you're up against as an end user, is convincing the boss that you need to buy this software. And the boss is going to be like, you mean I need to pay twice to get from A to B? And the answer is yes.

Now we're always thinking about better ways of packaging and offering our solutions. So just because this is the structure right now, pay attention to blogs and things that are going on, because that may change in the future. Especially with a product that it is this new. And we're experimenting a lot and learning our way with this new product, which is really different than anything we've ever done before.

So lots of changes happen. In fact, did you guys know that InfraWorks 360 is developed using a program called Agile development? Anyone ever heard of that? It's a development cycle. In the past, traditionally, we would put out a software release once a year. So you really would only have a viable release of software every 12 months.

Well with Agile development, our developers hold to a promise that they're going to have a fully functional piece of software at the end of each sprint. A sprint is a short period of time, it's

two weeks or three weeks. So in the past when we only had, really, working software every 12 months, we now have it every two to three weeks. So we're able to really change quickly and be agile with response to what our customers are telling us about what to do.

OK. So let's dig in to some of the features we're talking about. There is one more thing I want to clear up. We did a little name change about a year ago, and I wanted to explain that.

At one time there was a product called InfraWorks and a product called InfraWorks 360. I'm going to try to do this without confusing you. If that doesn't sound familiar to you at all, just tune me out for the next two minutes, because I don't want to add confusion if there isn't any there.

Before last year, what used to be InfraWorks 360 LT was just called InfraWorks. It had no 360 on the name. And then the upgrade product from that was called InfraWorks 360. So we renamed it a bit, and both products now have the 360 in the name. And the lighter one now is LT and the full blown one is just InfraWorks 360. So it's weird. We made the name shorter for the bigger product, and longer for the lesser product. If you were wondering what's the deal with that.

All right InfraWorks 360, we're not talking about the vertical applications right now, we're talking about just the core product, which you can currently buy by itself. And by far, my favorite feature, maybe in the whole program, is Model Builder. Did anyone do the test drive in the booth?

I had the pleasure of running the test drive a fair amount over the last few days. And what we did is we invited people to come up and try out in InfraWorks 360. In fact, let's do it. I would ask them-- I would let them drive and I'd say call up Model Builder, and I want you to type in the name of a town you're familiar with. And I think every single person did the town where they live.

Somebody give me a town name that they're familiar with.

AUDIENCE: Austin.

ERIC CHAPPELL: Austin, Texas? All right. So we're zoomed out pretty far on Austin, I'd like to get into about 10 square kilometers. Guide me to an area that maybe you're familiar with.

AUDIENCE: A little south.

ERIC CHAPPELL: A little south.

AUDIENCE: [INAUDIBLE].

ERIC CHAPPELL: All right, let's try that out. So I'm going to call this downtown Austin. I'm going to select my group, so let's just put it in my default group and click Create Model. I'm going to talk about this in a little more detail than I did during the test drive because my goal there was just to get people to try it and see how awesome it was. And actually, let me do this, let me hit Create Model, and then I'll talk about it. Because we can give it a little time to process while we're talking.

So what I just did is I zoomed in on an area and I sent a request up to the cloud that said, build me a model of this area. And InfraWorks 360 is going to use freely available data from Open Street Maps for roads, buildings, water features. Terrain data came from USGS. And we have Bing imagery. So it's going to pull all that together for me and build a model out of it.

Now if you've ever gone through the pains of trying to gather your own GIS data to build up existing conditions of a project, I mean typical project, how long does that take? Starting from zero and actually finding the data, compiling it, getting the coordinate systems lined, up how long is that take?

AUDIENCE: A few hours or a day.

ERIC CHAPPELL: A day?

AUDIENCE: Six months.

[LAUGHTER]

ERIC CHAPPELL: So I heard a day, I heard half a day. Can anyone do it faster than that?

AUDIENCE: 30 seconds.

ERIC CHAPPELL: You can do it in 30 seconds? So what? You have SITEOPS. Oh, we don't say that word. We don't say that word in here. I'm kidding. Yeah, I'm familiar with that tool. Yep. And it's a good comparison, between the two.

But yeah, if you're going to try to do that on your own, starting with going out and just finding the data, it can take you a while. And it's kind of frustrating, too, because you're having to pull

in data with different coordinate systems, they don't always line up. The places you get the data, you don't always know what coordinate system it's in. So there's all kinds of frustrations that go along with that.

AUDIENCE: Quick question. [INAUDIBLE]

ERIC CHAPPELL: It is. Yeah and I had a couple of people-- actually I was surprised. Someone who I thought really knew the software well was surprised to find out that we had global coverage now, and we do. When we started out, it was only the US. But I would say for a year it's been global coverage.

Now there are some extreme areas like above the Arctic Circle, and things like that, that we don't cover.

AUDIENCE: Is this very close to the [INAUDIBLE] that we use?

ERIC CHAPPELL: Say that one more?

AUDIENCE: [INAUDIBLE]

ERIC CHAPPELL: I'm not familiar with it, so I couldn't answer that question. Sorry. Thank you. Excuse me one second. Sorry for the interruption. OK.

So I think we agree, doing this from scratch would take a while, right? Surprised it hasn't popped up yet. But I want to talk about some of the options we have up here. So I did the simplest option, which was to zoom into an area, and go with that, with a rectangle.

We can also draw our own rectangle. So if I wanted to just pick out a certain area like that, I could. We can also draw a polygon. So and this is handy if you're doing like a road corridor. You want to do a model along a road corridor, and you just wanted to bring in that data. And we even have the option to import a shape file.

So I could hit that button, go out and grab a shape file, which is in ESRI format. Drop it in. I have a data set that I use for the town of Ashland, which I live near, in Virginia. And went out to the county GIS website, found a data set that had outlines of all the towns and cities and counties. I can drop that in there and carve out, perfectly, the boundary of Ashland. And the shape of my model itself is in the shape of the town, so it's pretty cool.

At the current time there's no-- it looks like you should have choices here with what data you

can bring in, but really it's kind of just a static interface. It may be a little bit of a picture into what we're thinking about later on. But for now this is what you get. You get roads, buildings, imagery, and elevation or terrain data.

You can also go to these functions up here and switch between views. There's a bird's eye view, which gives you some aerial-- it's a hybrid of aerial and road and it tilts the view for you. I tend to stick to the road view. To me it's more clear. I can usually go by road names and figure out where I want to be.

All right, so that's Model Builder. And I'm still not seeing my model pop up. Usually it's showing up here long, long ago. So let me jump into this Ashland demo. We'll check on it a little later. Maybe my internet connection isn't as good as I think it is in here. And I'm going to go to the master proposal.

So that's what I was talking about with that shape file carving out. I imported a shape file in Model Builder and it carved out the perfect shape of the town of Ashland right there. So that's the Model Builder part. And then we also have the Collaboration part. So with the Collaboration part-- when you start with Model Builder, it creates the model in the cloud, right from the beginning.

And let me ask you this question. How many of the companies you work in are nervous about the cloud? Yeah we see a lot of that. I've heard people say that they don't want to use InfraWorks 360 because they're scared of the cloud, and security, and that sort of thing.

And compared to other products that are very cloud oriented, InfraWorks 360, I would say, if you take out a typical day when you're using the product. If you're using it to its fullest, you're really only accessing the cloud maybe 5% of the time. Right? Because even though your model is stored in the cloud in order to open it, it does go through a download process.

So it downloads the data, and you work on it. And then when you want to save your changes back to the cloud, you can do that explicitly yourself. It's not like a constant exchange of data that you have no control over. It's something that you control. And the cloud is used as a convenient central storage location. And the data is very secure.

We could get into the standards and that sort of thing. It is not yet FedRAMP certified, but we're working toward that. I'm surprised it hasn't happened yet. I guess it's a longer, more complicated process than we thought. We've been working on it for several years now. And I

think it's not so much about the specs of how we store our data, it's about the process, and getting it done through the government.

With the Collaboration tools, you can take a model, publish it up to the cloud, and then what you do is, you create a group. And that model lives in the group. And anyone you invite to the group lives in the group. And they have access to the model. So that's how the Collaboration piece works. So let me demonstrate some of that to you.

Yeah, there it is. Let's see if we can get that one to open. Now that is going to take a moment to download. Now it usually starts out with a longer time estimation than what it really is going to take. That's going to be pretty quick. Good. Thanks for spotting that.

Yeah usually the models come back in like two minutes. I think we say 10 but it usually comes back in two. But it I guess it depends on how busy the service is, and maybe other services around it that are also processing in the cloud. This is why I love Model Builder, because the data is always right there, you just have to go and grab it. And if I zoom in here you'll see some of what I've gotten.

I've got roads. And these are vector roads, they are not just pictures of roads. And I've got the Bing imagery, as you can see. And in more populated areas I'll get major buildings. Now the facades are applied randomly, so the facades may not look like what they really are.

We've got a stadium here, Texas Longhorns. So that's pretty cool, but I'm sure that's not what the stadium looks like on the outside. But as I learned getting ready for the design slam, you can go out to Trimble 3D warehouse, probably download a model of this stadium, and drop it right in there in its place. And you can just grab this guy and delete him out and drop in your own model of that building.

So it's not like you're stuck with what you get. If there are certain buildings that you'd like to be more representative of what they really are, InfraWorks is an editing tool as much as it is a context tool. So that's how that's how slick Model Builder is.

Since we're in this model, we can talk a little bit more about sharing and collaboration. So because I used Model Builder-- and if you remember when I created the model, I chose a group for it. Right? And it was one called defaultgroup@ericchappell. So ericchappell is my account name, your account name might be the name of your company. I had one created for myself from the product team.

It could be whatever you want it to be. And then within that account, you can create as many groups as you want, as long as you're an administrator in that account.

If I go back to the Home screen, I've got some controls up here that have to do with groups. Let's go to this one first, Manage Group Membership. I'll go to my default group, which I believe these are arranged in alphabetical order. Now I have two accounts here. I have Autodesk support, and I've got my own account.

And then these other accounts that you see are groups that I was invited to, like Jason Hickey who is a coworker of mine. He invited me to a group, so his account is listed here. But I want to find my own default group under my name. For some reason it's not letting me select that group. Bear with me just a second.

Actually I think where I want to go is here. Add users to groups. Here's what we want. So you can see some of the people that I've added to this group in the past. And right now, those folks all have access to that downtown Austin model that I just created.

In fact if, they had InfraWorks 360 open to the home screen? At the same time that tile popped up on my screen, it popped up on theirs, too. Because they have membership in that group. They have the ability to access that data. There are different membership levels.

You can be a publisher, which lets you publish changes to a model that is there, but you can't create new models in the group. You can only publish to ones that are already there. An author can create new models in the group. And a reader can only download the models. You can't even make changes if you're a reader. And that's something we changed recently.

If you're a reader in a group and you download a model, it will actually disable about 80% of your user interface. Anything that allows you to modify the model. In the past we would let you modify it, you just couldn't publish it back up. But we realized there were loopholes around that. You could detach the model, copy it, make changes, and then publish it as a new model.

So now if you're a reader, you're a reader. You can't change that model, even on your local machine. All right, so I can invite anyone I want to that group, just by simply entering their email address. And if they have an InfraWorks 360 account, after I send the invitation, if they're not already a member of the group, under the notification section, which isn't visible right now, because they don't have any, they'll get a notification that says, you've been invited to a group.

And you can actually click on the notification, accept the invitation, and then magically the tiles will appear that are part of that group. So that's a function that you can do with InfraWorks 360, not LT. Something interesting about LT, though, is that if somebody creates a model, they can invite you to a group, and you can download and work on that model. So even if you have InfraWorks 360 LT, and I'll try to pay close attention. I'll try to explain this without being confusing.

If you have all you have is InfraWorks 360 LT, somebody with full blown InfraWorks 360 can create a group, invite you to it, put a model in that group, and you can download it and work on it. Where your capability stops is that you can't publish any changes back up. Because you simply don't have that little sync button up in the top that I showed a moment ago.

But you still have access to the cloud, which is kind of why we changed it to InfraWorks 360 LT. Because you still have access to the 360 services, you just can't publish changes back up there. Even if you buy one copy of InfraWorks 360, full blown, for your office, the other folks who just have LT can still benefit from that, because they can work on the models that are created by, maybe the one person that's the real guru of the product.

So something to think about if you're trying to get more capability, but you can't upgrade everyone all at once. You want to do it a few at a time. Another thing you can do is, you can manage the models in your groups. So again, I'll go into that same group, defaultgroup@ericchappell. And it will show me all the models that I've published to that group. There are quite a few. That's my dump everything group.

And I can go in here and remove them, download them. You don't really, truly delete a model until you get it out of here. If it started there with Model Builder, to get rid of it completely, this is where you want to delete it from. And there is a limit on the amount of space you have, based on your contract. So you want to make sure you don't fill that up and start getting yelled at because you don't have space to store your models. Good maintenance is a good idea with this stuff.

I think that covers Collaboration pretty well. Any questions on any of that? Yes sir.

AUDIENCE: I work in rural areas a lot and with farmers and [INAUDIBLE] and stuff like that. When they download it from the cloud, can I just have it into my computer without having internet access?

ERIC CHAPPELL: Yes you can. Yes you can. So the question was, and let me make sure I get this right. So you create the model using Model Builder. And you want to make it local only? And you want to be able to work on that model without internet access? OK. So a couple of things. First is, by opening that model, you've already downloaded it. So you can't open a model in the cloud, it has to be downloaded.

If you noticed when I clicked on that Austin model, a screen came up and I had to click Download. So that's a requirement. Even though it happens in the background, and most of time I don't even pay attention to where it's saved. So all the data you need is already on your local hard drive. Or you can also save that to a network, now. That's something you couldn't do before.

The other thing is, remember that licensing happens through the internet. So when you open InfraWorks 360, you have to log in. Now if you've just been in it, it'll use a cookie and log yourself in for you. But after 14 days, that causes you to re-log in.

If you're a regular user of InfraWorks 360, and you notice one day it just asked me to log in randomly, you probably just went over your 14 days and it's like, all right, just checking. Just making sure you're who you say you are. So that's your limitation. You can take that model offline, unplug your laptop, and you've got 14 days to run that software until you'll eventually hit a point where it will ask you to log in.

And you're going to have to plug in so that it can go up to the cloud, validate your license, and give you access to the software. That's really your only limitation. Any other questions about Collaboration? Model Builder?

Something else I want to point out with Model Builder is-- I mentioned that you're not just stuck with what you get. You can make changes. You can also add to it. So if you've got better building data, wipe all that out and add your own building data that came from the county. If you've got better imagery, by all means use your imagery.

There is a way to up the quality of the imagery that you get. I'll show you that. If I go here to ground imagery and configure. By default you get about a-- I'll just show you here. Notice that it picked this level 17 imagery quality. That's not quite the best. The best is typically level 19. And it's quite a bit better than what you see there.

It says 2.896 meters per pixel. I'm sorry, 0.2 versus where I'm at now, which is one point

something. So it's a fraction of the resolution. But there is a trade off. It's going to take a while to download. You'll get really good imagery, but it's going to take a while to download. Like, go get a cup of coffee, time. OK? But it's worth it if you're willing to wait for that download time.

AUDIENCE: That wouldn't affect [INAUDIBLE] model after?

ERIC CHAPPELL: It depends on your machine. And where you're at, at that point. If you brought in the maximum 200 square kilometers of area, and you're already pushing it, and your fan's running full speed, and you drop in that extra high end imagery, yeah, it's going to affect performance.

AUDIENCE: [INAUDIBLE]

ERIC CHAPPELL: Yeah. I mean, there are settings for that, too.

I guess the answer is, it depends. On a lot of factors. What are your settings in the software? What are your machine specs? How big is your model? What other things have you dropped in there? Performance is never a straight answer because there are so many factors.

But it will make a difference, whether it's a noticeable difference or not just depends on those other factors. Any other questions about this? Yes?

AUDIENCE: For a large area like this, [INAUDIBLE] model and then clip out just a small area for a project?

ERIC CHAPPELL: So the question is, can you clip out a smaller area for a project? So let's say you do a whole county, or a whole town. You probably couldn't do a whole county, but say a whole town as a master model. And now you want to go do some work on this part of the town? That is possible. The way you would do it is you would make a copy of the model.

You can do it here. From within the model there's a duplicate command. There's also a duplicate command on the home screen. So you make a copy of the model. And then in the copy you would go into model properties and change the model extent. Right now on using everything, entire model. But you can define a bounding box, almost like an image clip or something like that, where it will restrict the size of your model to whatever area you define.

I don't know that I would do that. Because I think that that big model may get really big and unwieldy. But you could try it, it's worth a try. Especially if you spend a lot of time bringing in Model Builder and then bringing in your own data and fixing things up. One thing about Model Builder is it's free data.

This isn't our data. We didn't provide it. We don't know how good it is in every tiny little corner. And sometimes you'll get a place where a bridge just doesn't form itself quite right. And if it's an important area of the project, you'll want to go in there and fix that, maybe, right? So if you've spent some time doing those little corrections, I could see where you wouldn't want to start from scratch every time. Yeah.

At first I was thinking maybe that's not such a great idea but I'm rethinking that now. Considering that maybe putting other work into that after you've brought it in could be worth having that master model to carve from. Yeah.

AUDIENCE: Would you send a proposal option-- would that be another way to approach that?

ERIC CHAPPELL: Not that particular case. So the question was, could you use a proposal to do that? To carve out parts of the model? The model extent arches over all your proposals. So if you change the model extent, it'll change it in every proposal in your model. What's interesting about that is, two years ago that wasn't the case. Model extent was unique to each proposal, and we changed it at some point.

It was probably for better performance, or more efficient data storage. Something like that. Because I'll tell you, the size of an InfraWorks 360 model has gone down by about 90% since we started. I mean, they used to be big monsters. Six, seven gigabytes. Anyone remember that? And now, the same model that was six or seven gig is now 250 megabytes.

So we've really learned how to store data more efficiently. And I think doing that was part-- part of the solution is that we don't store everything in every proposal. We try to share what's common across multiple proposals. So that was a really long answer to, I could have just said no. Good. One more question?

AUDIENCE: Yes. Regards to performance. Does InfraWorks use a GPU to speed up rendering?

ERIC CHAPPELL: Oh you're asking the wrong guy about computer hardware. I really don't know. It's one of those things I just don't store in my head. I know guys that can rattle off every detail of that, and I'm not one of them, unfortunately. So I'm sorry I can't answer that question. All right, let's move on to the verticals. And just doing a time check here, used about 30 minutes. That's good.

As I mentioned, InfraWorks 360 has the capability of adding in three, currently, verticals. And you can see them shown here. This brown icon is Roadway Design. The purple one is Bridge

Design. And the light blue one is Drainage Design. We call this within Autodesk this is the mustache icon.

These extend the capability of InfraWorks amazingly. I mean, we're not just talking a little bit of additional functionality. These are programs in themselves. So let's talk about Roadway first. And a good place to start with Roadway is, what about the road tools in the core product?

So this orange icon, by the way, is the core product. That all you own is in InfraWorks 360 LT, you're going to have that orange icon. In fact, I want to mention this, too. This is an aside, but I want to mention it while I'm thinking about it. If you've got someone, maybe a client, or someone in your project that's working with you, or has a stake in the project, and you want to show them your InfraWorks 360 model, all you have to do is tell them to go out and download the trial.

By default, that install is a free viewer of InfraWorks 360. You can invite them to your group, and they can open your model. They don't even have to launch the trial. In fact, I would-- anyone from Autodesk in here? I would tell them not to. Because of the complexity. If all they want to do is view your model, and they're not interested in ever buying it ever, then don't even activate the trial.

Because they're going to get a lot of extra buttons that are not going to mean anything to them. When you use it as the viewer, you get a very simple user interface. It's like five buttons. And you can invite him to the group, they can download that model, open it up and look at it. They can take measurements. They can play your storyboards. All kinds of stuff.

So it's a useful tool if you want to share your model with people. And because of the cloud, you don't have to e-mail them anything. You don't have to put it on a hard drive and mail it to them. You just invite them to the group. All right.

So Road Design. Start with what Road Design looks like in the core tools. So I'm going to click the little pencil icon here. And we've got a roads tool here, so I'll click that. Choose a style. And I'm just going to play around in Austin here and do some development. Is that a cemetery?

AUDIENCE: Yep.

ERIC CHAPPELL: Yeah, we don't want to develop there. I've seen "Poltergeist." I'm not going there. So we've got maybe a little bit of green space here, we might need to take out some residential area. I'm

just going to put a road from here over to here. And let me put a little curve in it.

All right. Now this is coming from the core tools. And I just want you to make a mental note of, when I click on this road, look at what the gizmos look like. Those are the little symbols here in the corners that kind of look like AutoCAD grips. These I can use to manipulate what I've designed.

Notice their color. There's only one on the corner. I don't have any control over the curve itself. The curve just is some magical formula. It's actually a spline. So this is what we call a planning, or a sketch, road. There's not a whole lot of control. But there is some.

I can raise things up. I can go into the style and kind of control this side slopes. But I'm limited, really, as to what I can do. And the things I can do are designed for somebody who doesn't know anything about, or care about, civil engineering. So there's no concept of a horizontal curve, or vertical curve, or any of that. Or real slopes, like three to one, two to one.

These roads don't think like an engineer thinks. They're more for representation and showing an image of the road that you can say, hey I'm thinking of putting a road here. Now let's do instead, a Design road. Now I'm going to go to the road design tools. Click the pencil icon. There's a lot of consistency in the user interface. And now I see some different tools.

I see tools that are classified by use, from local to collector, to arterial, to highway. And the difference between these tools is design speed. They each have a built-in design speed. And you can override it if you want. But the design speed dictates how the geometry is going to be laid out by default. And that is based on, right now, AASHTO standards.

You can go in and customize that. So if you're not doing work in the United States, you can customize it for other standards. Right now it's a hack, but it's totally doable. And there are country kits out there, too. I know there's one for the UK where you can and you can introduce the UK standards into this. And the numbers are going to just increase on that. You're going to get more and more possibilities for standards.

So now I'll do the same thing. I'm going to use local road here. It's the same styles. I can choose from the same list of styles. I'll even pick the same one. And I'll do the same thing. I'll start on this road. Pick a point over here for a curve. Notice the different graphics right off the bat, right? There's definitely something different going on here.

And this is a bad intersection because of the angle, but I'll go ahead and go with it. Now it

automatically detected that I have a crossing over water. And I also have the Bridge vertical entitled. So it's asking me, hey, there's going to be a bridge here what style do you want to use? And I'm going to go with concrete girder.

All right. So now I've got this road. And it just functions a little bit differently. Can see it cut into the hillside. It's got, if I click on it, look down. You can see I've got a lot more gizmos to control the geometry. This curve is an actual horizontal curve. If I click on it, I get a radius, which I can edit.

I can even go to edit curve and add some spirals. If I want a more complex solution. That's interesting. That's why you gotta love demo, right? So I can also turn this down on its side. And you guys probably know this about InfraWorks already, but if I'm looking down on an object, I get different gizmos than if I change my view perspective.

I mean, that's almost too easy. That's unfair. I don't even have to do anything, except look at it from a different angle. It's better. So obviously I've got a really deep cut here, so I can add a PVI. It comes, by default, with a vertical curve which I can lengthen if I want. And then I can also modify this PVI. I can move it up and down, I can move it forward and backward, along the alignment.

And now I'm thinking like a civil engineer. If you gave all these tools to somebody who really didn't understand civil engineering, they'd be like, what's a PVI? I don't know what that is. Why do I care how long this curve is? Things like that.

Now I didn't really pick the greatest place for this road, so why don't we do something like this? Instead of intersecting with this road, I'm going to cross over it and, I don't know, do something silly like that. And we'll lift the road up over-- live demo ladies and gentlemen.

I don't know why it's not letting me add a PVI there. Let's try here. Interesting. All right let's go a little further. It might not like all these intersections. This may not be pretty, but we're going to get it done. No kidding. Sorry about that. Well one of the great things about InfraWorks 360 is how quickly it opens after you've done something that it didn't like.

It does use a completely different data structure than Civil 3D. Oh it's not going to like this model now. Dang. Sorry about that. Well I wish I had time to troubleshoot, because I'd love to show you like how to get around doing that, but I'm already 45 minutes into my session. So I'm going to jump back over to that Ashland model, I think.

Well, it saves constantly. It's a database. It's a SQLite database. So it's saving constantly as you go. Notice I never have to hit save. If you want to do that trick where you do a bunch of work, and you're like nah, I don't like that. I'm just going to close without saving. No, you can't do that. So that will get you sometimes.

So what you can do is create a proposal. I want to remember this place right here. I'll create a proposal, and then I'll go do work in another proposal, and then I can always restore that one to get back. And that's why I always keep my master proposal, that's like layer zero. There's always a master proposal.

And a lot of people will jump right in and just start going to town on the master proposal. I like to, immediately, first step, create a new proposal and work in that. That way I can always go back to master as my existing condition starting point.

AUDIENCE: So if you run into a problem like you just did with that [INAUDIBLE] model, how do you get back to that master?

ERIC CHAPPELL: Well the first thing that I would have to do is troubleshoot why I'm getting the error. And that involves getting into some of the files and trying to find the problem file, and correcting it. The other thing I can do is, I never published my changes, so I could-- there's an older version of that model up in the cloud, so I could remove the local version and re download the cloud version, and start from there. That's also an option.

There's a couple of different-- you know how it is, there's always 10 ways to skin a cat. Yeah. And it gets really bad, I'll just send it to the product team, because they love trying to figure out how to crack those puzzles. All right. So let's do a little work here in this opening.

So I do the same thing. I'll do my local road. I really like that style, that's the one I typically use. And we'll just kind of snake through this little forest here. Tie-in. And I'm double clicking at the end to tell it then I'm finished with the command.

One thing that it does, it did well here, is that automatically defined my intersection. Cleaned it up for me. Over here, not so good, but it's probably about where I placed my landing point. So I'm just going to move that over there a little bit.

I may need to do a little work here to get this all to work together, but another thing I've got going on, and I didn't show you this earlier, is if I do start out, or someone else starts out, with

one of these planning roads.

Let's say someone only has LT. They don't have access to the full vertical. So they use the tool they have. They go in and they create a road. And just real quick, I'll drop one in here. And now I'm the heavy duty designer. So I get this model from them.

And this is the road they've laid out for me. And it's a planning road, or sketch road. No problem. I can right-click and convert that to a design road. And now I've got a road that has horizontal and vertical curves, and all the engineering things that we talked about, including a profile view.

All I did was I right clicked on one of the PVI's and said show in profile view. This is 100% engineer speak now, right? We're in engineer world where we're editing PVI's. You can see it moving in the model as I move it up and down in the profile view.

I can also move them horizontally, which is something you can't even do in Civil 3D.

AUDIENCE: [INAUDIBLE] the data [INAUDIBLE]

ERIC CHAPPELL: The question was, the data that came in from Model Builder, will it have profiles too? The answer is no. The only way you can get a profile of a road is if it's a Design road. If I wanted a profile of this existing road over here, I would have to first convert it to a Design road, which we saw is really easy. And once I do that, actually the profile should pop right in here because it's already selected.

Now that actually brings up another cool point. Intersections. Let's talk about intersections with this vertical application. So this intersection is pretty simple. I want it to do more. I want to have turn arrows. And I want to be able to add turn lanes, and things like that. But I really can't do any of that. And the reason is because this is a design road, and this over here is a planning road.

So all I have to do to get my full intersection functionality is convert that to a design road. And do a little cleanup here on where the two touch. And now I'm going to get my fully functional intersection. And you can see I've got the turning lanes. And I can even do things like-- notice this lane here turns both left and right.

I can change that, and tell it I only want to turn right. And if I had a median here, if I change the style and put a median, let's try that out. Let's do a little magic here. And it'll give me a chance

to show you, too, how you can change styles. There's a number of ways, actually. But let's say I want to improve this road and make it into a divided fancier road, like that.

Right now this median is still open because it sees that I'm allowing a left turn lane here. If I take away that left turn and make it straight, the median closes. It actually is going to help control traffic flow. And the story continues.

Another function of this module is traffic analysis. Traffic Simulation. I'm not going to demonstrate this, because it actually uses the cloud. It has to go up, gather some data, bring it back. I could choose an area, and ask it to analyze the flow of traffic.

And it will actually consider all of this traffic turning control in that simulation. So it's all smart. It's all tied together. Not just the median, but right down to how is this going to affect traffic? Am I going to have areas where traffic is backing up? Or areas where I'm having to really slow down to allow that traffic to stack up? And if I do, I can always modify the intersection.

So I'm going to change th-- I'm sorry?

AUDIENCE: [INAUDIBLE]

ERIC CHAPPELL: So what is the limitation on the area for Traffic Simulation? I don't know the answer to that. I do know the price goes up, because right now it's Cloud Credits. You expend Cloud Credits for traffic simulation. And the larger the area you select, the more Cloud Credits it will use.

I don't believe there's a limitation, other than maybe what your model can handle, or what your computer can handle. So just following along in that story, let's say you do find that there's a problem with traffic. And traffic is really backing up here. So let's create a turning lane.

So we've got some really slick tools that we can do that. The traffic simulation will actually show us how much storage we need, so we can run it and actually see these long bars that show the backup of traffic. The queuing of traffic. And if we need more space we can just move everything back.

So these are all functions that you get with the Roadway Design vertical application. I'll show you another option you can do. There is a low. We're not seeing this stream definition through here, but there is a low. You can kind of see it in the photo. So I've got a situation here where I need to cross a body of water. I can, at any time, because I have the Bridge vertical added, I can add a bridge.

And we'll get into the Bridge vertical a little more later. But my bridge is pretty low to the ground. So like I was trying to do earlier, I'm going to add some PVIs. Create a ramp up to the bridge. And I'm doing this rough. If you wanted to do it more accurately, you certainly could. Very specific distances between your points, and that sort of thing.

But what's powerful about this is it's all so visual. I don't have to take what I've done-- just imagine doing something like this in Civil 3D, right? You'd have lines on a screen. You couldn't show that to somebody who has no idea what they're looking at and have them know what they're looking at. It just looks like lines on a screen to them.

But you show them this, and it's obviously a bridge. And they start asking questions like, why is that pier there in the middle? Or where's the water? They're not asking like, what am I looking at? What does this line mean? So you can immediately communicate what you're designing to anyone. Because it's so visual, and it's a representation of what's out there.

And they look at it and say, you know, this doesn't look right, right here. And you know, yeah. You know what, I need to fix that. Let me move that up a little bit. Try doing that with Civil 3D in a live session, in a meeting or whatever. Question in the back?

AUDIENCE: Can you print that?

ERIC CHAPPELL: Well you can capture it as an image. So if I go here to the presentation tools, I can create a snapshot which will export an image of it. I can take that image, drop it into a Word document, or whatever, and print it from there. But you can't print directly from-- but in one extra step you can print it out of anything.

AUDIENCE: I assume you can go back and forth with Civil 3D [INAUDIBLE].

ERIC CHAPPELL: Yes you can. There's a command in Civil 3D. It's called open InfraWorks 360 model. So you launch that command. You pick the SQLite file that represents your model. And you get a bunch of options. You can pick and choose what you want to bring in, right down to individual roads. You can pick what styles you want to assign to the objects as they come into Civil 3D.

And for a road, it will bring in the alignment and the profile. And then you can attach your own assembly to that, and build out the corridor. Question in the back.

AUDIENCE: So InfraWorks 360 and Civil 3D have to be in the same release [INAUDIBLE], right? You can use InfraWorks 360 2016 and push it to Civil 3D [INAUDIBLE]?

ERIC CHAPPELL: Technically you could. It's a complicated answer. Civil 3D 2016 has the open InfraWorks 360 model command in it. Civil 3D 2015 with Productivity Pack does also. But you go beyond that, say to 2014, you don't have that open InfraWorks 360 command. You do, however, have the ability to import IMX. So you can go into InfraWorks, export it as an IMX file, and bring it into Civil 3D.

You're eventually going to go back to a point where you can't do IMX anymore. I don't know what release, maybe 12. I don't know. But then you can use LandXML. And you can get some of the data over, like maybe terrains, or alignments, or things like that. So as you go further back, you get less capability, but you can still get the data in there. They're still technically compatible.

And going the other way as well. You can pull data in from Civil 3D into InfraWorks 360. If I go to data sources, one of my choices is a Civil 3D drawing. As you move back into older releases, the translation isn't as good, so you're going to get your best result from the most up to date product on both ends.

But you can still do it. Moving back in time, so to speak, you just don't get quite as good results. Good question. All right.

AUDIENCE: If we bring the model into Civil 3D, does it create a corridor?

ERIC CHAPPELL: It does not. So the question is, when you bring-- I'm repeating for the recording. If you bring the model into Civil 3D, does it create a corridor? It doesn't. It only brings the alignment and the profile. You have to add the assembly and build the corridor.

AUDIENCE: And you can add survey [INAUDIBLE]?

ERIC CHAPPELL: Sure. Yeah. The survey data may already be in Civil 3D at that point, and you're just adding to it. And you can also bring your survey data. You start with Model Builder, which is a pretty rough surface, it's not super accurate. Or even if you have your own GIS data, that's even not super accurate.

But once you've reached the point where you have your survey done, you can bring that survey terrain into InfraWorks 360, and it will be just as accurate here as it was in Civil 3D. So if you want to really tighten up what you're designing here, that's totally possible. Typically you're going to have a much smaller area, but it'll actually drop in and modify that one area.

And maintain the stuff outside.

So you will have super accurate terrain data right where your project is, but on the fringes it will be less accurate. Which is probably OK in most cases. So next, I wanted to show you some more analysis capabilities with the Road Design module. So let's take a look at sight distance.

I'm going to open this sight distance calculator. Select a road. I don't know what the official terms are, but I break this into two categories. There's open road sight distance, and then there's intersection sight distance. I'm going to show you both.

I'm looking at stopping sight distance. I'm looking at the forward direction of lane one. There is only one lane, so I'll go ahead and click analyze on that, we'll see what we get. As I zoom in, I see that we've got some areas highlighted in yellow, and some markers. And if I want to know what that's all about, I can hover. It tells me there's a sight failure.

And the failure, apparently, is getting around this embankment. And if I want to analyze a certain spot, I can place a sight pin. I'll drop it right there. And now I see a visual representation of what's causing the sight problem. And you can see it, if you put yourself in perspective.

I actually, when I first saw that, I was like, you know what? I really don't see what the problem is there. But that's the beauty of being in full 3D all the time. When I put myself in the perspective of the motorist, now I see it. It's this little crest of this hill. It's so steep I can't see over it. And that's why I have a sight distance issue.

You can see the orange here that's highlighting the actual dirt that's in the way. I mean, it doesn't get any easier than that. Whether you're doing it yourself, or you're showing someone else, like, look we have a problem with this profile. We're not going to be able to do what we think we were going to do, because of sight distance. And then if we want to switch, we can go the other way.

Click analyze, see if we've got anything going on there. Looks like we may have a similar situation down here. We've got another site failure. I could place another site pin in for that.

So now let's look at the intersection. We can do an intersection, too. So I'll click on the intersection. It does a completely different interface there for that. I can do no control, stop

control or yield control. Let's try no control. Click analyze. And it looks like everything's pretty clear. We're not having any issues. It's all blue.

Now if we put an obstruction in the way, let's say we put a building over here. We decide we're going to put-- this is going to be a gated community, right? So we're going to put a gate house here at the entrance. So I'll drop a building in here.

And that's a pretty big gatehouse, but let's go with it. And we'll do no control. Now you can see we've got an issue, right? The building's color in red. It's a problem. It's an obstruction of the view. This area is colored in yellow.

But what if we put in a stop sign? Does that help us? It does because now we have to pull up there and stop. And we're past the building, so we're good. We're stopped, we're looking. The building is no longer an obstruction.

So imagine the problem solving power. You're sitting with a client, hey wait a minute, we want to put a gatehouse there. All right, that could be a sight distance problem. Let's see where do you want to put it? Well right about there. I mean, this is happening in real time. OK.

Let's see what the analysis turns out. We have a problem we're not going to be able to do through traffic. What if we add a stop sign? Let's try. I mean that's the power of this software. You can't do that with Civil 3D. Civil 3D has things that it's great at, but you can't do that. And again, this is all part of the Road Design vertical.

All right. I have 30 minutes left. I want to leave a little time to give out the books. And I've got two more vertical applications to cover, so let's keep going. We'll do the Bridge Module first.

I showed you how to add a bridge, I'm just going to go ahead and do that once more. At any point, I can right click on a design road only, not a planning road, and add a bridge. Pick two points for the bridge. And it's that simple. Currently there are two types of bridges.

So if I click on this bridge, this guy here, this is called an asset card, or a card. We'll call them cards sometimes. And notice that I have two types. Precast I and steel plate. So if I switch to steel plate, I get something like that.

I'll tell you. I'm going to try something. I'm not real crazy about the graphics here, so I'm going to try to give us better graphics. If it slows me down then I'll go back. It's still pretty good. So what I did there is, I went to this visual effects setting. The simplest way, there's a toggle

between high visual quality and not so high. And I just toggle it on.

Can you see the difference? Everything is a little more clear. So now that I've got my bridge, I'm actually going to switch back to precast I, because I can show you cooler stuff in there. I've got all kinds of things here I can change for my design. Notice I've got different design standards in here.

And like I said earlier, we're getting better and better, and adding more design standards to different parts of the product. And this is a brand new addition, the ability to do Australian, British, anything other than LRFD. We've added that capability very recently.

So I can choose my design standard. Some of these numbers are static, they're just there because that's how you made the bridge. For example, the length of the bridge, I can't go in and change that value numerically, but I can change it graphically, and type in the starting and ending stations.

So if I wanted that bridge to start at exactly station 1400, I could type it in, and that's where it'll start. So you do have numerical control over everything, it's just sometimes it's in canvas, or in the model, and sometimes it's on a card like that. I can change the number of piers. Maybe I'd like to see three piers. I can move the piers around. And I'm avoiding the temptation to give you guys a bridge design class, I really just want to show you capability.

I'm sure you're probably wondering, how do I do that? And what about that? And what about that? Yeah you can rotate the piers. You can move them around. And I always love this. I mean, watch what happens. I'll try to get a good angle here. Watch what happens when I rotate this pier.

All right, we've got multiple box beams. Actually, I forgot one of my favorite features. This was added recently. I can right click the bridge, and say toggle deck transparency. Now we can really see it, right? So I just made the deck disappear. Don't worry, it's still there. But watch what happens. Watch the bearing areas when I rotate this pier.

This just fascinates me, when I rotate the pier, watch what happens. Of course this time it's not going to work. I think last time I did that, it did the same thing to me. I think what I did is, I rotated the foundation instead of the pier. See that?

It realigned all the bearings, and where the girders meet each other. Got all those little bearing pads on there, with the neoprene pads. So it's very detailed. These components are sized

based on engineering calculations. It's not just a pretty picture of the bridge. The number of girders, the depth of the girders, are all based on the span. And the span based on the number of piers.

Now it's not a completely designed structural system, but it's definitely a good start on one. And in fact, this links into our Structural Bridge Design product. And my friend and colleague Mark Burgess who came to us with the acquisition of the company that did structural bridge design, I can't remember the name of the company before.

He knows ways to get the data out of this, and into Structural Bridge Design and continue the design, and push it forward. So that data is all there.

AUDIENCE: So do you only get just the typical bridge structures? If we do a lot of concrete [INAUDIBLE]--

ERIC CHAPPELL: One of the things we added recently was a lot of different pier types. So if you want to do something a little fancier for a pier type, you can do that. So a lot of different pier types now. We used to just have columns like this. They could either be square or round, and that was it. But now we have more choices.

Now if you want to do something custom, I think there's a way that you may be able to make your own custom shapes through like Project Chameleon or something like that. So the technology is rising for that, to make your own custom shapes, but it's just not fully supported, publicly available yet. Does that answer your question?

AUDIENCE: Yes. We're using a lot of-- I do a lot of [INAUDIBLE]

ERIC CHAPPELL: OK.

AUDIENCE: [INAUDIBLE] those kinds of things. They're not necessarily [INAUDIBLE].

ERIC CHAPPELL: Right. Yeah I know we don't have capability to arch spans or anything like that. But we do have different custom piers you can work with. And then within the pier itself, you can control some of the dimensions of the pier. The width of the pier.

You can actually shape the pier itself. And another cool thing that we recently added is, once you get a pier the way you like it, you can say apply to all piers, and then it will apply those settings to all of the pier for the bridge.

Just lots of stuff you can do with the Bridge Module. And I did all that, I haven't even touched

the icon for bridge, yet. I didn't even touch this guy. So you can start from scratch if you want. If you don't like right click menus. I'm very old school, so my right mouse button is just like ready to go all the time from using AutoCAD and Civil 3D, and Land Desktop for all these years.

I tend to default to a right click, but we also have commands here that will launch the bridge creation tools. We've got some analysis, too. The toggle deck transparency is fairly new, but the real analysis is this line girder analysis, which you notice is grayed out. It is

It is actually a preview feature. I'm not a structural engineer, so I don't understand most of what this does, but I do know that you can run this analysis. It will use the cloud. Right now it's free because it's preview, so it doesn't charge any Cloud Credits.

I'm thinking that eventually when this feature goes big time, we'll charge Cloud Credits for it. Maybe not. But it will go and do a very detailed analysis of your current girder configuration, and give you some results on that.

And again, I'm not even near qualified to explain any of that. I know people who are, though, so if you have questions, hit me up after AU and I'll get you in touch with somebody who can answer those types of questions.

All right. So that's Bridge. Now let's look at Drainage. Again I'm going to default to the right click menu. I've got my road here. And I'm going to just select it, right click, and add pavement drainage. A card comes up, and I've got some options. I can choose what type of inlet I want.

I did most of my design work in Pennsylvania, so that kind of looks like, I think it was a Type 2A Inlet. Let's see, we'll pick that guy there. And then manhole, that's probably good. And I'm going to do another little trick here.

By default, what it does is it puts the manholes in the center. And then from the manhole it goes left and right to the inlets. Again, I'm not crazy about that. I don't like having all those manholes in the center of the road.

I believe my road lanes are 12 feet, so I'm going to make my center line offset for my manholes 12 feet. And what it does is it aligns the manholes with the inlet and it says, well, I don't need you anymore because I don't need to make a bend or connect anything, so the manholes all go away. And I save my save my client money.

So I'm just going to hit enter. And it's going to generate a storm system for this entire road. Inlets, manholes if they're needed. Just give it a moment for those tiles to regenerate. And when you first do this, you won't see the inlets. You just have to be patient and they'll start popping in there.

Those guys are sticking out of the road a little bit. Not sure what the deal is there. Let's see what we have down on this end. Come on tiles. I had to go and use that higher graphics setting. Let's look at these guys, even though they're sticking up out of the pavement, and I'm not sure why.

If we look underground, we'll see that we've got pipes connecting those inlets. And normally they're set flush to the pavement, so I'm not sure what's going on there.

AUDIENCE: Did that 12 foot offset it?

ERIC CHAPPELL: No, that only affected the manholes. So I'm not sure. But I can move them down. Check it out, I've got a visual spread calculation right there. I can even hover over that and it will tell me how wide the spread is around that inlet.

The magic of InfraWorks happens by some assumptions. So it's assuming flows. It's calculating some flows based on some assumptions about rainfall and things like that. And right now, I think it's a hack to edit some of that stuff, but you can do it.

And we're always improving the product, so it would be completely plausible to think that we're going to have a user interface that's going to let you use the method that you want, and enter the values that you want. But you can see some of the data it's using here with rainfall intensity, the area it calculates. The runoff coefficient. It's using pavement.

Another limitation is, it doesn't consider off-pavement drainage. So any drainage coming onto the road from a hillside. It only looks at what's between the curbs. But it's a starting point. It'll lay out all the inlets that you need, all the pipes that you need. It will connect them all together.

And you can edit them, and adjust them, as I'm showing you here. You can do it graphically or numerically. I'm going to try this out here. It's telling me my elevation is about 224.73. So let's see if that will work if I type in 224.8. Yeah, pretty close.

So you can see how easy it is to edit that stuff. And you can move things around. I can take this inlet and I probably don't want it there, I probably want it along the curb. And it seems like

it reset its rim elevation when I moved it, which is pretty cool. Sometimes I work with the software too much, and I forget some of the things it can do, if that makes sense.

And then we can do quantities. I can right click this road. And we're going to do it outside an intersection. Actually I need to go here. That's what I'm looking for. I want to know how much of that stuff I have. How many inlets? How many pipes?

Not sure what's happening here. I did select a design ramp. Oh there it was. Come on now. All right. This is what I was looking for. Inlets, 101 of this type. If I had different types, it would break them down as such. Pipe. That's how much pipe I have. 3,147 linear feet.

Oh notice it's all the same size right now? Here's another thing I can do. I can right click and say size pavement drainage. So I probably want to tweak the layout a little bit, maybe add an inlet where I need one, and take one away or I don't. But once I get everything where I need it, I can see the flows that are contributing to the inlets.

It will go ahead and size that for me as well. And again it's based on assumptions. At some point, you're going to want to take it into Civil 3D, and really get it down to an accurate design. And maybe take that into SSA and get more accurate flows based on regional data. But when it's done here, it looks like it broke it down into 18 and 21 inch pipe. So now I've got two different pipe sizes that it decided to use.

And there are rules about what minimum pipe sizes are and things like that. So that's part of Drainage. Another part of Drainage is watershed analysis. So let's say I want to know what the flow is going to be passing beneath this bridge. Maybe I want to say, maybe I don't need a bridge. Maybe I just need a culvert.

So I'm going to create just a point watershed. I can do a point or I can do a road. And I can control the accuracy. I always like to go to the most accurate possible. And I'll go ahead and press enter.

And hopefully we can do this fairly quickly, because it is going to utilize the cloud. It's going to send my request up to the cloud. It's going to send the terrain data up to the cloud. So it's going to look at that point. It's going to look at the shape of the terrain, and figure out what the drainage area is contributing to that point.

AUDIENCE: How accurate is that going to be versus if you had some actual CSV file.

ERIC CHAPPELL: Accuracy versus a CSV file of what?

AUDIENCE: Well, I'm sorry. Like if you had that [INAUDIBLE] survey [INAUDIBLE]

ERIC CHAPPELL: It will get will definitely be more accurate with survey grade terrain, because it's reading the terrain. It will also take longer to analyze. However there is a limit. I don't know if you noticed when I was moving those sliders, it's looking at breaking the terrain up into grid squares. And I think the smallest square it will use is maybe 10 meters.

So even if you're old school, but even if your surveyor went out and surveyed every 10 feet on a grid if it's a flat area, you're only going to get down to that minimum grid size. You may not get down to that same accuracy. It may still shave it off a little bit. I'll give this a few seconds to run.

I really think my internet connection here isn't super great because the Model Builder took about three times as long as it normally does. I think it's about ready. So there we go. There is the area contributing to the point that I selected. We can zoom out a little bit. And I can actually click on that area and tell it what method I want to use.

Right now it's at user defined, so I can enter in my own values. But I can also choose-- something going on with my UI here, where I'm clicking stuff and it's not always responding. Not sure what the deal is with that. So I may just have to describe this to you. This is weird.

If I choose a different method, like rational or regression, then I can go in and specify the runoff coefficient. Or for regression, you choose a region. I think you choose a state, and then a region, and it will fill in the other numbers for you. It will actually give me flows there, and I can use those flows to decide whether I need a bridge or a culvert.

Another thing I can do with Drainage. Let me take this bridge out of here. That's weird. I'm going to close this model down and reopen it, because it's acting funny. Once again, just showing how quickly you can open InfraWorks 360.

I did find, though, that once you put it to sleep. If you try to wake it up immediately, one second later, it doesn't necessarily like that. Give it like 5 seconds to shut down. Let's see if we can get this method to work now. No, that's still not working.

That's it, I wasn't in edit mode. Silly. Look at that. So let me explain that to you. So when you select an object, there are two modes. There's this edit mode, and select mode. And if you're

not in edit mode, you don't get the ability to edit things. And it's a right click.

You're either in edit mode, or you're not. And I just needed to toggle that on. There's also a button up here where you can switch between edit mode and select mode. That's all I needed to do. And now I can show you the, let's say, regression. This happens to be in Virginia. And this is not the Appalachian Plateau, this is the Piedmont area.

And you can see some of the flows I'm getting there, right? Pretty quick. Easy. When you do a full blown hydrologic analysis, are you going to get those exact numbers? No, you're going to get something more accurate than that.

But it's a great way to make some decisions, like culvert or bridge, right? So let's say we see those numbers and you say, you know, I think I could put a culvert there. Bridge is probably overkill, and a heck of a lot more expensive. So I'll take out the bridge, I'll select the road, right click, and say add culverts.

And anywhere it sees a stream crossing the road, it will go ahead and add a culvert. It will also place it based on the invert of the stream, where it crosses the embankment of the road. And you can see it there. And also there's a card for that, too. And it should pull in the flow. Not sure why it didn't do that. We've got flow there.

I expected to see the flow here from the watershed, but I'm not for some reason. Yeah I'm not sure why. It should have automatically picked up this flow from this watershed. Let's go ahead and enter a flow here. You can see that the culvert resized based on that flow. But I did something funky with where-- it should recognize the watershed flow, and pull that in automatically and size the culvert accordingly.

So that's a real quick rundown of what you can do with Drainage Design. So let me switch back to my PowerPoint here. And we'll wrap things up. If you guys are all InfraWorks 360 LT users, and I think most of you are, we know that that's a good thing. Was there-- sure.

AUDIENCE: [INAUDIBLE] opportunities for Civil 3D pipe networks?

ERIC CHAPPELL: Yes. The drainage networks will come in as pipe networks in Civil 3D. Kind of along the same answer as I gave earlier, if you've got the latest version of everything, you're going to get the best result.

You're going to get a one to one match between what you have been InfraWorks and what

you get in Civil 3D. Civil 3D will actually build the parts list based on what you bring in from InfraWorks. It's pretty slick. But it will come in as a pipe network.

The culverts will not come in. Those you may have to FBX out and bring in as a 3D object. But it doesn't grab the culverts, yet. But getting back to our wrap up here. You all, most of you anyway, are using InfraWorks 360 LT so you know how good that is.

Hopefully with what I've shown you today, you can see that just InfraWorks 360 with the Collaboration, with the Model Builder, that tool is just invaluable, as to what you can do with it. You can start any project with it. Even if you're still primarily in Civil 3D, you can use InfraWorks like you did that old Google Earth import command.

You can go InfraWorks, build a model, and then open that up in Civil 3D, and now you've got your terrain, your imagery. And you can get your imagery already from Civil 3D. But you've got roads, buildings, it's even better than Google Earth, because you get vector representations of roads and buildings as well.

So Model Builder which I mentioned. Now you add all the verticals, and the amount that you can do is just amazing, and staggering. We were in a discussion about the verticals in a meeting earlier, I think yesterday, and one of the users in the room said, you know, I don't even know why you guys have three different verticals, because we use all of them all the time.

Like, when do you do a road and not do drainage? Or when do you do a road and not do bridge? So they're all very powerful. So the great power of InfraWorks 360 is this concept of doing preliminary visual design. So if you're early in the project, you're not worried about getting everything down to the teaspoon of earth, and every tenth of a foot of elevation.

You really want to get a representation of what you're thinking of designing. To show the client, to show the public, the planning commission, whatever it happens to be. At this point in the project it would be silly to worry about all the little details. So let's make some assumptions and let's crank that design out really quickly.

And oh by the way, let's do it in an environment that is so visual that all you have to do to show it to someone is just turn your screen around. You don't have to do extra work, like you do now with Civil 3D, right? Going to a meeting? Well you've got to take that Civil 3D drawing, save it as something else, color everything in, label it. Because you're looking at lines on a paper, or

lines on a screen in a PowerPoint or something.

You really have to explain to the untrained viewer what they're looking at. With a picture like we have with InfraWorks, that's not required. I mean, my youngest child is eight years old, and she can walk up to me when I'm using InfraWorks and she can pick out buildings and roads and grass and mountains and valleys. That's how simple it is.

It's really great to get that additional functionality on top of InfraWorks 360 LT. If you're not currently using this product, you're just on the fringe. I mean, you just got to get out there, and dig in and do it. It's groundbreaking. It's new. People are going to question what you're doing in the beginning. But you're going to be a hero very, very shortly.

And pretty soon, people are going to be asking you to do more stuff for them than that one experimental project that maybe you did first. I've seen it happen again and again. I've written articles about it. It just takes that special person who wants to go outside the box a little bit and try something a little different.

And then, I know some of you have been using it extensively for years now, so we've got those early adopters as well. So that's all I have. Don't go anywhere, I'm going to crack open the boxes of books, and give hopefully all of those away. But I want to thank you for listening, and I hope you found the class useful. Thanks.

[APPLAUSE]