KENNETH DRISCOL: So real quick, my name is Kenneth Driscol, Civil Application Specialist. Just a little bit history about me, I started surveying in 1986, from surveying went to civil engineering construction technology, from civil engineering construction technology did 12 years for residential subdivision and transportation, and then hydrology. From that, I've been doing training for consultants and I also teach over at Georgia Tech for the Capstone project for senior engineers before they graduate. We just got Civil 3D implemented into Georgia Tech's curriculum.

So it's been an ever evolving process. Software is ever evolving. We want to be able to evolve with the software.

So we come back, cut my clicker on, maybe not.

So traffic simulation, it's just a tool that allows you to see the flow through intersections, display color-coded traffic analysis, and then generates that result in a simulation in animations. So that's the easy part. The more difficult part is now you want to put in time and demands, and different loads at different times of the day, which would simulate what would be happening in that intersection. Right?

The critical thing that you should know is, when you're using traffic simulation it doesn't work on the regular roads. So it only works on design roads and component roads. So if you define an area and it's not working, that's the first reason you should look at. It's because you don't have design roads in there. The other thing with design roads-- any Autodesk employees in here.

Well, this is our circle of trust like James Wedding always says-- in InfraWorks they have these design roads where it's based upon actual standards. You can do pavement drainage. You can do all those things, really nice functionality, right? Now you look at component roads, which they've added in. They've been in there. With component roads you can do cross sections, super elevations. And it gives you a visual display of those things. If I'm in a specific area, it gives me a cut and feel, all the information necessary for me to make a clear decision about where I want to move that road. If I go to design road, you can do that.

So on one hand, design roads, which really started out being very critical to InfraWorks 360, it

doesn't do the same thing as the component roads. So when you get R2 and you pick on a design road-- and I'm going to go through it-- when you pick on a design road and try to do a cross section, you don't get that menu. So there's a little something they have to work on. I mean, as a civil engineer, you want to be able to just say, OK, I want a cross section of this, right? So something to think about.

So as we move on here, after this, you'll be able to open up the traffic analyst panel, walk through that, put in your own demands, in terms of that, pretty straightforward. Learn how to configure traffic simulation, learn how to configure traffic demand, and flow, from that analysis panel.

A little bit about me, we talked about that already.

And then, InfraWorks is your opportunity to communicate ideas. We have a project. We don't want to spend any money. We want to try to communicate of what that project would be like without spending a lot of money. So I did concept plans for residential, 100, 200, lot subdivisions for 12 years. And I went back and forth, and back and forth, and back and forth. Being able to communicate those ideas without losing all that data, InfraWorks addresses that issue for any civil infrastructure project. So whether it's hydrology that you need to address, whether it's storm pipes you need to address, whether it's sight, whether it's grading, you can do all that in InfraWorks.

So civil infrastructure projects, preliminary design, winning work. As an example, I worked on a project in Florida, some of the biggest consultants vie for this $5 million intersection and road down for a middle school. They walked in with foamboards, like we've done for years, me and my consultant walked in with this laptop. And we played a video. And we said, this is the first phase. This is the second proposal. This is what this project will look like. And a half an hour after we left there, they called and said, that consultant won the job.

So you have to think about it again. InfraWorks is about communicating ideas. It's all about traffic simulation. We talked about that already. Traffic simulation only works with component roads and design roads. Again, we're not going to-- this is not the *Catcher in the Rye.* So I'm just going to blow through some of that verbiage. OK?

So considerations when we look at street design, clarity, complex intersections-- we're going to take a look at that-- multiple compact ones, bins and streets, mirror turn lanes, curb extensions, medians, align stop lines, legs of intersection. We don't even have to worry about

those things. We're just going to start putting some stuff in there. And then we'll see what we get. And then we'll modify it. And then we'll push through there. OK?

Compactness, minimize an intersection, we do have to consider that because based upon federal and highway standards they only can be so small, right? And then multi-modal-- someone said they had five legs, six legs-- and conflict resolution. And then also, no matter what we do we always have to consider public space. Right?

So as we move on here, converting an intersection-- just, if you haven't done it before, converting an intersection to a roundabout. Basically, we pick on our intersection. It gives us this contextual panel. And then we can just change it from an intersection to a roundabout. It's just that simple. And we can pick the size of roundabout that we want to use. So pretty straightforward. Has everyone did that already? OK. So most people have done that. OK.

So and then when we go to change the roundabout, then it's going to give us certain parameters for FHWA, in terms of roundabout layout and design. OK. So then you can change the roundabout stack based upon that menu. And you can modify it. And we'll look at those things also.

And then of course, streamline intersection geometry. So one of the things that-- you guys said you've done this already so I'm asking questions-- so one of the things that you're going to run into is this intersection right here. Can anybody tell me what's wrong with this intersection right here?

AUDIENCE: How is it going to break and turn?

KENNETH   Yeah, how do the cars know where they're going to turn and do all that stuff, right? So that
DRISCOL: part is also critical in Release 2 because some of the things in terms of intersection and lanes, you can't do with the InfraWorks that you have right now. And I'll show you some of those things. OK.

Sight distance analysis-- you all know that-- optimization, simulate traffic flow, sketch a traffic area, and then float through the intersections. And that's pretty much the process. But again, I said I'm not going to bore you with PowerPoint. This isn't the *Catcher in the Rye.* We're just going to do it.

So don't worry about the free training contest. If you get-- the free training contest was based

upon, you-- I did a class the other morning and said, if you went to register you could win an Apple Watch or a free training for a year. So someone won that, the Apple Watch and the free training. So it was just an opportunity.

So I did three other classes this year. One that was fairly well received-- was green storm water infrastructure. All that's on the Autodesk website. You can download everything. I've got step-by-step of how to do it all. OK. That's it. That's my PowerPoint. I may have went over five minutes.

OK. So now here we are. If I zoom out just a little bit, so we've gone through that little-- so I haven't done anything in this site right here. So one of the things that we want to take a look at is, if we go to model builder-- which I will in a second. And I'll put in this Florida address-- but right now if we look at it, these are just for regular old that comes from model builder in InfraWorks. And model builder will generate-- and I'm just going to jump back out real quick. And this site, this model is only fast as the internet. So under model builder we can go anywhere in the world, generate a model based upon roads, buildings, aerial imagery, and USGS data.

OK so. What's the address?

AUDIENCE:	Lane Ave.
KENNETH DRISCOL:	I'm sorry.
AUDIENCE:	Lane.
KENNETH DRISCOL:	Lane?
AUDIENCE:	Ave, L-A-N-E. Lane Ave.
KENNETH DRISCOL:	Oh, Lena.
AUDIENCE:	Lane, car lane, like a car lane.
KENNETH DRISCOL:	Oh, carlane. So--

AUDIENCE: L-A-N-E.

KENNETH DRISCOL: Yes. L-A-N-E.

AUDIENCE: Ave.

KENNETH DRISCOL: Hold on for a second, for a second, L-A-N-E.

AUDIENCE: Ave.

KENNETH DRISCOL: Ave? Oh.

AUDIENCE: Avenue.

KENNETH DRISCOL: OK.

AUDIENCE: Fort Myers. Fort Myers, Florida.

KENNETH DRISCOL: Yes, ma'am. Take it easy.

[LAUGHTER]

AUDIENCE: Show's on.

KENNETH DRISCOL: There we go. Is that the area?

AUDIENCE: Yep.

KENNETH DRISCOL: OK, so where we at?

AUDIENCE: Right where your--

KENNETH This area? This is going to be the roundabout?

DRISCOL:

AUDIENCE: Yeah. Thanks.

KENNETH DRISCOL: Sure. Well, we got time. We're going to do an intersection.

AUDIENCE: Lane Ave. is going to come straight down. The intersection is going to be where these three roads intersect. And Lane Ave. will come straight down in it.

KENNETH DRISCOL: OK.

AUDIENCE: So, if you get that area blown up, it's that one.

KENNETH DRISCOL: OK. OK, thank you.

So what we want to do is we want to define the area. We're just going to do this. Look, that's not even 0.17 square kilometers. So we're just going to call this Florida, something simple. OK. I've addressed one person's issue for this class. OK, so I'm moving on here. We'll go back once that comes up.

We'll jump right back to that roads tutorial. So now, let's just take a look at what were looking at before we-- and we're going to get to traffic simulation. So if I pick on this road and right-click, I don't get much because it's a regular road. I can split the feature. I can convert it to a design road. I'm going to convert this to a design road, pretty straightforward. Now we don't have the splice. We don't have the different vertexes. We just have an end point, a mid point, and an end point. OK?

I'm going to pick on this road. I want to right-click, convert that to a design road. The two roads that are basic roads that come together, once we put a design road in the intersection of it, it creates an intersection. OK. So everybody should be familiar with this. It's no big deal. This design road doesn't cross all the way. That's the reason why it's not creating an intersection with this palette

So I'm just going to move back over here, something simple. If I pick on this intersection, now it gives me that palette right there. So is everybody fine with that? We talked about being able

to edit and modify. So if I look at what it brings to the table now, I can convert this to a roundabout, or I can set different zones in that intersection. So the first thing that I want to do is, I want to take a look at this idea of creating a roundabout. OK?

So if I pick on that, and I'm going to change this to just a different truck size. So we have to think about Autodesk vehicle tracking, right? So of course, my curve radiuses have changed automatically. But now I want to think about this idea of a roundabout. So I know we're going to do the roundabout for that road, that's Florida. But this is as simple as it gets, in terms of a roundabout. So I'll just pick it. And it gives me an error warning right there. It says, invalid geometry roundabout. OK. So spacing-- so it's not that it's not an intelligent object. It's going to tell you whether it fits or not. And it's going to tell you the reason why, which is good because we need to be able to communicate, right?

So now let's just zoom out a little bit. I'm going to create a design road, so something pretty straightforward, a design road. And I'm going to put it from here, something simple, double pick right there. Beginning point, end point, there is my design road. If I pick on this design road, I can right-click, show a quick profile right here. I just want to add a PVI, so something plain and simple. And then that PVI, I want to drag it close to the existing ground. When I pick outside of it, it updates my road. OK.

Doing that in Civil 3D-- right-- takes a little bit. So I'm just showing you some really quick things. So I'm going to create another road, a street with sidewalks. So if I pick on it, and I'm just going to cross it right there. And we're still on this idea of roundabout. So if I pick it, it gave me an intersection. So if I pick the intersection, it brings me back to my palette. So I open my palette. And now if I change this, we can change it to a roundabout because I know the lengths work here. OK. And then, based upon that roundabout, I can change it.

So, just some of the quick things that I had in the PowerPoint, we can change that to whatever we want, in terms of-- all the way to 2010. And if I wanted to change that to triple lane roundabout, dynamically updating. And let me make that a single line. So anybody editing roundabouts here? OK. So if I pick on it and it gives me several different grips. I can move the roundabout based upon this grip. If I pick on another grip, now I can move the size of the roundabout. So just some really quick things, in terms of a roundabout. And then if I pick my circular, I can change the radius. OK. So just some flexibility, in terms of a roundabout. OK. Everybody fine with that? And then I'm just going to exit right out of there.

Now what I want to be able to do is, I'm going to change from a different model. And then we'll try to look at the traffic analysis. So I'm just going to jump to-- and you can see the Florida model has already been created. It's just kind of sitting right there. So it's just something that you should be able to do, pretty straightforward. So that's the idea. You're going to have an intersection. You've got three lanes coming in. You change those three lanes, which come into an intersection, change it to a roundabout.

AUDIENCE: [INAUDIBLE].

KENNETH DRISCOL: Sure. I mean, yeah. I mean, yeah. And those would be pretty simple to do also.

OK, so the reason I've got this is because I want to look at this traffic analysis. So I have a couple of bookmarks in here. And I've got this cloverleaf here, which is what my intent was, in terms of my lab earlier this week. But I want to see what happens when I use this traffic analysis panel. So this is not a simple, just intersection, so we've got some things going on here, right? So let's try it.

So here's my traffic simulation, all I went to do is, go up on my road design panel-- this little Libra sign, scale. We'll just pick it. So I want to review and modify. So I'll select traffic simulation. So what it does is it grabs all my design roads. So based upon it grabbing all the design roads, now I need to define a traffic study area, in terms of a boundary. So that's what I'm going to do. If I pick right here. It's going to change the color of my screen. I see all the other design roads that I have in my site. I'll come up here. And then I'm going to pick outside of this point here and pick outside of this point. So you will notice that the physical area is being updated as I'm moving my cursor. And then the chargeable area and the valid roads are being calculated as I define my area.

So it says, 16 intersections. So if I double pick right there, it says, converting 205 roads. So there are some roads over here that weren't designed roads-- so just giving you the reasoning why it's saying it's doing that-- and then it's going to show me what's actually going on, in terms of those areas, in terms of entrances.

So it brings up my traffic study area. And then within my traffic study area it shows me my analysis, in terms of, what kind of results do I want to see? And I want to see basically, per approach. So in per approach it says, my delayed threshold is three. I'm going to use that as

my default. I can take it all the way up to five. And then on the simulation it says, a quick simulation. And I just want to run a quick simulation.

So it's simulating. So any questions? Anybody else? Questions? Questions? I mean, it's simulating so we might as well address questions.

AUDIENCE: Does it have a place [INAUDIBLE] on?

KENNETH DRISCOL: Yes. Now, in order, in terms of adding those things, you want to use component roads to be able to do that. OK? Yes.

AUDIENCE: [INAUDIBLE]?

KENNETH DRISCOL: Yes. Yes. You can make it a component road from a design road but not a component road to a design road. OK?

AUDIENCE: How do you model the ADA ramps?

KENNETH DRISCOL: Now, the question was, how do we model ADA ramps? So in order to do that, now you're talking more detailed design. I use Civil 3D for that. So clearly you can go in and create grading for that. But when you're talking ADA ramps, you're talking a small area. And you're talking a specific grade for those.

AUDIENCE: OK, let me simplify it for you. How do you represent where a crosswalk is going to be?

KENNETH DRISCOL: So--

AUDIENCE: You don't necessarily need to show that you're meeting the ADA requirements but--

KENNETH DRISCOL: Right so--

AUDIENCE: The intersection right now when you get left to right period--

KENNETH DRISCOL: Right, so in order for me, if I was doing that, I would bring in an image that represents that. So like DWG, a 2D DWG that had a crosswalk and that would be the simplest way to do it. I mean, anything else, you're going to be working with trying to model this existing ground and a proposed.

Question? That's done. OK.

So once the simulation is done, then you get this animation player. And then you just pick play. And then it starts out and it shows me how long it's going to take. And if I zoom in here, you can see traffic.

So one of the things that you start thinking about is, you start saying, well, there's not enough cars. And how am I going to determine what's what? The way you do that is, you want to go into the traffic analyst panel and change demands. So I can come over here and see specific vehicles coming around the cloverleaf, and things like that, and turning in different lanes. But I want to see more traffic and see where it bottlenecks up at to simulate the specific area. So in order to do that, I'm going to stop that. And I'm going to close that out. And then I'm going to go right over here. And then I'm just going to right-click. And I'm going to select traffic analyst panel.

And that's OK. It says, provide access to the advanced parameters. I typically show that because I show it often. So then it brings up this traffic analyst panel. This was acquired, this portion of the traffic analyst was acquired I think, like two years ago. So it's been in the software for some time.

AUDIENCE: Quick question, can you import a file [INAUDIBLE]?

KENNETH DRISCOL: So the question-- and it's not that I can't hear you. It's that it's being recorded. So the people who are going to be listening-- I just want to repeat your question.

So the question is, can you import a spreadsheet file to simulate traffic. And you can, yes.

So now that we got into the parameters here, now we want to take a look at the actual traffic analyst, in terms of changing demands. So we have several parameters. Clearly, there is some cloud. And if we select edit, there is some undo and redo that we can generate. And then terms, and behaviors, and restrictions, we can add all those to specific vehicles, specific lanes, in reference to this traffic analyst panel. We're not going to go into those. We can do specifically, in terms of intersections, ramp metering. We also can go into demands, which is what we're going to go into. And then we have a display, and then a help in reference to the program.

So if I go into demands, now you can see from that profile, this simulation. And there's 17

vehicles. OK. So that's why you don't see a lot of vehicles in there. So I'm going to close this, just to see our quick simulation. And then we've got long monitoring. And then we've got short evening-- excuse me-- long evening. So I'm just going to zoom out of here. And then I'm going to come back in to demands. So based upon these demands now, I'm going to go in-- so if I double pick in the window-- we're going to say, 30. And I'm going to say, 30. And again, you'll be able to come in and simulate as many as you want.

So I'm going to create the bottleneck effect. And then I'm going to select OK. So we'll just see this quick change. So I'll close that. And then we'll run the simulation again. So you could have multiple simulations, where you can see the difference between the two. And then you can quickly, you can see there's a little trash barrel down there, where you can delete that actual model for that simulation.

So we'll wait a couple seconds for that. Any questions so far? Or has everyone done this?

AUDIENCE: Question for you, collecting real-time data from intersections and stuff for a 24 hour period, is there a way to import that into the program so--

KENNETH DRISCOL: Yes, you can do that with a spreadsheet. Excel, yeah.

AUDIENCE: Can you export this to traffic simulator in Civil View?

KENNETH DRISCOL: There's not a traffic simulator in Civil 3D.

AUDIENCE: [INAUDIBLE]?

KENNETH DRISCOL: Oh. The what? I'm sorry.

AUDIENCE: It's a visualization option in Civil View.

KENNETH DRISCOL: Oh, in Civil View. Yes, so it's a different file format. But yes you can, that file, yes.

What was your question, Sir?

AUDIENCE: Can you import a specific term, or is it just the total volume for the area, for overall

intersections?

KENNETH DRISCOL: I'm sorry. Can you input the what?

AUDIENCE: The specific term movements of vehicles being intersection compared to [INAUDIBLE]?

KENNETH DRISCOL: No, you have to add all that data in.

AUDIENCE: So even for--

KENNETH DRISCOL: Yep. You have to add all that data specific-- just like them throwing out a line in traffic cars, you can't simulate that.

Oh, so we're ready.

AUDIENCE: Before you're about to show that, can you comment on the credits used for the various efforts that you have to do?

KENNETH DRISCOL: The Cloud credits, it's one Cloud credit every time you run a simulation. I think with the InfraWorks subscription, I think, you may get 50.

AUDIENCE: I got a hundred with mine.

KENNETH DRISCOL: Yeah, depend on-- so this is another thing and-- in terms of detail data-- so there was an InfraWorks Lite at one time, where it gave you a certain amount of credits. Then there was an InfraWorks 360 that they gave you a certain amount of credits. Then there was an InfraWorks without the modules that gave you a certain amount of credits. So in the midst of them changing, flipping back and forth, that might have changed. OK.

So clearly, you can see more vehicles. So if I stop this at this point here, I just want to go to looking at one on my lanes. And if someone can assist me. I have a question because you guys have been using InfraWorks. So has anybody run into this, where your bridge deck and your abutment doesn't touch the existing ground? Nobody is running into that?

AUDIENCE: I've ran into that.

KENNETH DRISCOL: What's the reason it does that? All right. Nobody? OK. So the reason that does that is because the zone that's coming off this turn ramp, this ramp right here, it's going into that and it's

pushing that out. So you're going to have to change the zone, pulling the zone, back, because it comes at a default length. But you have to change the zone length. And that's going to address that. And that's my free advice for today.

OK, so is there something that someone has tried to do, in terms of the intersection-- because this, in terms of putting the vehicle demands, that's pretty straightforward. This is what you won't-- this is what you have to be very careful of with InfraWorks, in terms of what you have. Now let me close out of that. And let me exit out. And I'm just going to delete that traffic study. It's no big deal.

So this is what you have to address. If I go and edit this, you have specific zones that you can tell what you want the cars to be able to do. But clearly, if you just lay out design roads it's going to come as a default, in terms of what you want to do. Because some may want to have one-way traffic. Right? Anybody doing one-way traffic? Has anyone done one-way traffic?

So how about if I show you how to do a one-way road? OK. I'm just-- so something real quick, and we'll take a look at-- so InfraWorks-- again, about communicating ideas-- it's like a big playground. So my design road, I can just do street with sidewalks.

And I'll pick this point here. And I'll just double pick right there. That gives me my one road. Then I'm going to come right back. And I'll pick this point. And I'll come down and I'll pick this point. And then I'll double pick right there. OK. So again, it's looking at traffic going different directions.

So if I pick on this and say, I want to change my lanes-- so my lane forward. Here's my lane backwards-- so that my lane backwards, I want to make that zero. My lane forward, I want to right-click and add a zone to it. So I can add no lane. I can add one lane to specifically go in one direction. OK. So if I pick on this, no lane. So being able to push lanes in and out, pretty simple.

If you want a bike path, a walking path, pretty simple to take a lane out with this style. So I'll come right back in, add that lane in, updates dynamically. And I've got one lane that's going one direction. OK. If I want to change that, I have to go to geometry, pick my intersection, right-click, go back to my lane, and I can change that to a no lane or a split line. So that's how you make a one-way lane, pretty simple, pretty straightforward.

If I zoom down here, if I pick on my road coming across, and select geometry, I'm going to pick

my intersection. Then I'm going to pick my top. I can tell it, I want traffic to go straight through instead of making that left hand turn. So the idea behind everything that's going on in this traffic analysis is, you need to be able to tell traffic where it's going based upon these intersections. Because if you don't, then traffic is just going to be going based upon defaults, which could get challenging.

So as an example, I'm going to come right back in my traffic simulation. Here's my area that I want to define. No big deal. And I'm just going to double pick. So run a quick simulation--

So if you run the traffic simulation does it just run the near traffic simulation, it actually show that to your client when you--

KENNETH DRISCOL: Yes. And you can-- I'll put a video for this also.

AUDIENCE: In-- with that simulation running?

KENNETH DRISCOL: Yes. So when you go into that panel, you can output a video for that simulation.

AUDIENCE: A level of services like that, intersection analysis with a [INAUDIBLE]?

KENNETH DRISCOL: No. No, InfraWorks has city furniture that you can put in to simulate that, in terms of, once you really, for your final presentation, you can have street lights and all those things in there to address that. Yeah. And the only difference is, I'm not going to be running it at x10 in the video. I'm going to be running it at 2 so it actually, the car stops, and then it makes a turn in the video. So right now, I've got them going fast so you guys can see it.

These are designed roads, right? So it's something pretty straightforward. But the whole idea again, is the intersections. If you don't get the intersections right, then you're going to run into more challenging issues.

Yes, Sir.

AUDIENCE: Is there a limitation on the size of the [? steady ?] area?

KENNETH DRISCOL: No, the only issue with that is, when you start making the area a lot larger, then you're only going to get it in the video, in terms of seeing the cars. So right now this is why I've zoomed in. But you can see already, I can't see what's going on down at that end. That's why I had it

zoomed out. So the area, you can make as large as you want.

Yes, Sir.

AUDIENCE: [INAUDIBLE]?

KENNETH DRISCOL: Yes, so I mean, with that, in terms of graphics, you can change the graphics where I can see the buildings all the time. But it's just making the model larger, in terms of reaction.

AUDIENCE: [INAUDIBLE]?

KENNETH DRISCOL: Yeah. It's for build-- yes, for that too. Yep, definitely.

AUDIENCE: So if I [INAUDIBLE] that whole city, that simulation, and I've got a camera path line through it, I'll be able to see those cars within that animation?

KENNETH DRISCOL: Yes.

Wow, didn't even plug it up. Hold on. Yes, you will be able to.

Questions? I mean, this is not something where it's going to blow you out of the water. Yes?

AUDIENCE: Can you show us how you import traffic data from Excel or [INAUDIBLE]?

KENNETH DRISCOL: From a spreadsheet? And if we going to--

AUDIENCE: [INAUDIBLE].

KENNETH DRISCOL: No, he made reference to the-- from Civil View.

AUDIENCE: No, any, from, you know, traffic [INAUDIBLE].

KENNETH DRISCOL: Let me-- let me close that. So maybe they have moved that. I'll have to find where that is. But the spreadsheet, you can import an Excel spreadsheet. I just have to find where that is, that

you can pull in. The other question was the Civil View. So that's a different file format that he was looking at to bring in. But the spreadsheet, yes, you can bring in.

AUDIENCE: So sorry, but you were saying that it's exported the file format into Civil View.

KENNETH DRISCOL: No, that's what I was saying, the Civil View, nah, that's a different file format. You can't export that out to the-- 3ds Max is the program. Yes.

AUDIENCE: So there's no way to take this simulation and--

KENNETH DRISCOL: Not that file format. That's a whole different traffic program. So when Civil View actually, from 3ds Max they have an add-on that allows you to view and add that file format so you can do that simulation in Civil View.

Yes, Sir.

AUDIENCE: If you get creative can you do a shopping center parking lot?

KENNETH DRISCOL: So shopping center parking lot, most of the times when I want to do something that has parking and striping, I push it to Civil 3D, use Autodesk Vehicle Tracking, lay it out, create an export out as an SDF, and then bring it right back into-- Yeah. So in the mix, they have a site module that's coming out with parking, and curb, and things like that, in the mix.

Yes, Sir. Oh, OK.

AUDIENCE: So do you use a combination of Civil 3D, you've got your [? lines. ?] You start it here. You push it up to 3D. Then you push it to 3ds Max, then to another--

KENNETH DRISCOL: Yes.

AUDIENCE: --bring it back. So you can get more in depth--

KENNETH DRISCOL: Right so--

AUDIENCE: --parking lot type environment.

KENNETH DRISCOL: Yes, so the whole idea is concepts, InfraWorks 360. So from this concept you can push data, which alignment surfaces, parcel, coverage areas will go into Civil 3D. So you can pick on this

road that you just laid out in InfraWorks and send that straight to Civil 3D and it interactively-- if you change it in Civil 3D, it updates in InfraWorks when you push it back. When you talk about 3ds Max, now you're talking high definition, in terms of rendering. That's what 3ds Max does. But with 3ds Max you can take a Civil 3D corridor, a Civil 3D surface, drape it on an aerial in 3ds Max, and run simulation the same way.

The idea behind that is, it takes 3ds Max four hours and less than. So if you look at-- if you look at-- and I'm just going to delete this right here. If I came here in, for presentation purposes, if I came in and picked on that design road, I mean, I can create an animation that's pretty straight and simple. This is on another design road. But I can do that from any design road that I select to create a storyboard that quick. So let me just cancel this.

So I'm going to stop this. And I'm going to delete that. So from my design road, let me zoom out. Here's my design road right here. If I pick on it, say, storyboard, I can say, from this design road create a camera path. So I hit enter. And I'll select create. You can put the distance, in terms of horizontally where you want that to be. So I know what 3ds Max brings to the table and how long it takes. That doesn't take long at all, right?

AUDIENCE: No.

KENNETH DRISCOL: Yeah. So that's what the difference-- that is the only difference. 3ds Max, you're going to do rendering and things like that, which takes a lot longer. You can create the stuff. But to do this, depending on what you want to do, yes.

AUDIENCE: Yeah, I just did it for modelling an intersection [INAUDIBLE] traffic, just for vehicle--

KENNETH DRISCOL: Yeah.

AUDIENCE: Pulling back in here and now you're still in traffic.

KENNETH DRISCOL: Right, because ultimately what you have to consider is, if you're doing a concept plan, you may not even have the project yet. So you're just trying to check for feasibility and what it would look like.

Questions?

So let me show this piece. I'm just going to pick on that. And I'm going to edit it, right-click, and

show it in profile view. I'm going to add a PVI right here, just so we can raise that up a little bit. So this is my design road. So when I pick on it, I can right-click. And it says, show profile view, convert to a component road. So this design road right here, this is what it gives me. I can add right away, add a bridge. I'm going to convert it to a component road. And four lanes is fine. So now when I right-click on it, look how many options I have now. But as an engineer, you want to be able to go in and say, OK, well show me. I need to see what is going on along this road. And then when I pick on this and I say, well, what are my cut field numbers? I mean, the only way you're going to do this is if you have it in Civil 3D.

Yes?

AUDIENCE: Can you spit out each cross section [INAUDIBLE] inference?

KENNETH DRISCOL: Can you spit out each cross section?

AUDIENCE: Yes, and just sort of create these arrays just for costs.

KENNETH DRISCOL: It's just for cost estimating but this creates a finished grade and the alignment. You push it to Civil 3D, you can create the cross sections based upon sections, sample lines. Yes, well, see again, InfraWorks is about conceptual and being able to grab--

Some people started clapping over there. I'm like, what's going on--

--about getting this ideal of numbers for feasibility. And you can take it as far as you want. If you win this project and you say, OK, now we really need to go into more detail. You're going to start, by 1, getting the existing ground, a survey, because this is 10 meter data. In some areas it might be five meters. So you're going to get the existing ground for the survey. And then the proposed, you're going to start pulling that in if you want to do that. Yes.

AUDIENCE: Now, for instance, if the client came back and said, I don't want this road. I need a different design--

KENNETH DRISCOL: Yes.

AUDIENCE: --can you still edit this one in component. I know this is design.

KENNETH Yes, definitely. Yeah, this is-- this road right here, on this component road, see, I can edit it. I

DRISCOL:	can move it around, edit it, change-- yeah, you still can do those things.
AUDIENCE:	Can I change the styles?
KENNETH DRISCOL:	Yes.
AUDIENCE:	Add more lanes.
KENNETH DRISCOL:	Yep. You can change the styles, add lanes, things like that. It's just a design road. I just don't get why the two-- well, I do in a sense because they're adding different technology as this product keeps evolving.
	Yes, Sir.
AUDIENCE:	So, for her, if she had a one design road, then you could just go with another proposal if you make your evidence for that one.
KENNETH DRISCOL:	Definitely.
AUDIENCE:	Then you'll have two different options.
KENNETH DRISCOL:	Yep.
AUDIENCE:	And you can even change the geometry in the one and it won't affect the other.
KENNETH DRISCOL:	That is correct.
AUDIENCE:	And design.
KENNETH DRISCOL:	Yeah. Yeah, because the proposal is the big-- it's running on SQL Lite. It's a database. Everything that you do, it's recording. That's why we don't have this file, edit, view that we typically had in a CAD environment. We don't have this print button. This is this database. And it's providing information. Questions?
	So is anyone working on a current project in InfraWorks right now? So what are you guys doing?

AUDIENCE: Jakarta.

KENNETH DRISCOL: I'm sorry.

AUDIENCE: Jakarta.

KENNETH DRISCOL: Jakarta? That's some good work over there, right?

[LAUGHTER]

So you're using InfraWorks 2017. So you want to download R2 because it again, it gets you faster to where you're trying to get to. Who else?

AUDIENCE: I'm doing a couple of different projects in there right now. One of them was just to create an intersection through the YMCA and a four-way stop--

KENNETH DRISCOL: OK.

AUDIENCE: [INAUDIBLE].

KENNETH DRISCOL: So, yeah. So if we start thinking about how much time it takes to do this in CAD, you're not going to do it because it's not cost eff-- well, it's not cost effective right now. I mean, seven years ago, six years ago, we had to do it because we didn't have this. But now that we have this we want to use it. And everybody in here has Civil 3D? Everybody in here has Infrastructure and Design Suite? Everyone probably has-- well, not everyone-- but everyone should have at least InfraWorks 360. But you have to get in here and play around with it.

So like I tell everyone that I go through, if you start a project and you want some help starting that project, and you're kind of hesitant about doing it, and you need help, send me an email and I'll hope you get started with your project. And that's not like it's a cost thing. I want you guys to be successful using the products.

Because if you think about it, when a baby-- it has to crawl, and walk, and next thing you know it's doing this. But if you don't put your hands on this, every time you see it, you're going to say, why do I have to use this program? And your competitors over here are just walking in

saying, oh, here you go. Let me show you this. And let me show you this.

And ultimately, it's about return on your investment. That's what it is. We're all civil engineers, and designers, and yada, yada, yada. But every year they graduate thousands of Civil Engineers and designers. So you want to make yourselves valuable. Learn software because it's ever evolving. And if you're stagnant, that doesn't work. So it's just a tip.

I go to hundreds of consultants every year. And the first thing principals say is, why don't kids out of school know this software? And they've had it for years for free. And if you have an EDU account, you get this for free for four years, a student version.

AUDIENCE: It's called [? monitoring. ?]

[LAUGHTER]

KENNETH   In that phone, right? So, OK. So--
DRISCOL:

oh, we only have a couple more minutes? So again, the ideal is not that I want to just show you picks and clicks. The ideal is that you're going to run into some of these things. Like, has anyone used the grading that's in InfraWorks? So they have grading in here. You can set up a building pad and tell it, grade 3 to 1, 2 to 1, those kind of things. If you get real creative, you can take a style for this road, delete the pavement, delete the sidewalks, and just keep that curb in there, and then when you lay out this curb, raise it as high as you want, in terms of a retaining wall. Because it still reacts as if it's a wall. So it's just some things that you want to be able to do to quickly communicate those ideas.

But if I'm using AutoCAD, I'm not going to fast forward. But if I'm using Civil 3D, and these infrastructure InfraWorks, I'm going to be moving. And then somebody is going to be like, well, what's this-- I want you to do this next job, and then this next job. And next thing you know you say, I've got too much work. And you say, this is a great thing. Your in Jakarta somewhere. I don't know what--

[LAUGHTER]

So it's that kind of thing that you have to be thinking about. And I know talk a lot but it's about more than software if you don't put your hands on it. Again, just like regular AutoCAD, you open it up for the first time, you see all these buttons, pick that button like 10 times, the next

time you open it, you'll go [PING] and keep on moving. And that's what learning is, repetition.

So it's not like I'm trying to force learning on it. You guys just do it. Just do it. We've got a whole generation that's coming up, right? We have to be valuable. We have to be more efficient and more productive. We have to think like owners, in terms of return on our investment. And this is just helping us get there because there's still that old HP that's sitting around that we can use.

So all this information is on the website when you-- you can download it. My other classes-- this actual bridge subdivision-- let me just show you something real quick. So right now if I look at this different style, this road style, if I come here and say, I want to look at this different style palette-- so I'll come to this style palette, and I'm going to scroll down here, and there is that grading. If I look at road, I can look at this subdivision.

So someone came to me one day and was like, I need to maximize this whole subdivision. Can you tell me how many lots? You could do that with Civil 3D. Watch how fast I do it with InfraWorks, well, technically. There's my lots. 75 fit, 150 foot setbacks. I mean, I just did it. And the beauty of this is, whatever I do, in terms of this, it's dynamically updating. I can drop it in on any road style.

So now you have to think about, well, I take a look at this site and I start drafting all these roads in. And I don't have to push it to Civil 3D to do my parcel, and layout, and right of way, and this jigging line, and do all these parameters. I can say, I'll create a style and then I'll just drop it on there. And it just tells me how many lots.

So then I can go to Civil 3D and get that line work, bring it back in, then I can say, well, this coverage area right here will be this parcel. And I can start saying, this is more valuable, that kind of thing. And now you don't need that big foamboard because you've got this. So it's just some quick things that you should be able to do with InfraWorks.

And like I said, they have Project Kameleon that's been out. It was in labs. And basically, it's structures for storm inlets, couplings, couplings, and things like that for pressure. Those come from InfraWorks. You can create those from InfraWorks straight into Civil 3D, in terms of your storm. OK. So I know they have the pipe builder in Civil 3D but they're moving away from that, parts builder in Civil 3D. So there's a Project Kameleon, you just have to basically download it. They were running a trial but you can download it. And basically it has a whole catalog of structures.

Anyone using Civil 3D, there is multiple templates that have all the DOT structures, inlets, pipes, three dimensional, everything that you need in the public templates. Florida DOT has one. Wisconsin DOT has one. Caltran has one. Its free. I'll take that catalog, push it to my catalog in my template, and then you will have them, pretty straightforward.

Civil 3D structures look like a new program. The DOT structures look like the structures.

OK, I didn't mean to go over time, but please do your surveys.

[APPLAUSE]

Thank you.