SEAN HULBERT: Let's get started. Can everybody hear me OK?

AUDIENCE: [INAUDIBLE]

SEAN HULBERT: OK. Thank you. My name is Sean Hulbert, Timothy Sean Hulbert. I am a PE in the state of Oregon and I am a technical support specialist for Autodesk. I support Civil 3D, InfraWorks, and the hydraulics and hydrology tools.

The objectives that we're going to cover today-- where's my pointer? Well, let's start with this, the class summary. The corridors can be as complex or as simple as we need them to be. Remember that this is just another tool in your toolbox to extract information out to continue to build the model that's going to represent your design. So don't think of the corridors as a limitation to your design and don't think of it as-- you can use temporary orders, you can use multiple corridors, you can use combined corridors. It's a very powerful part of Civil 3D.

And just like anything in Civil 3D or AutoCAD, there are a number of ways to do it. This is the way I'm comfortable. This is what I did when I was in design. I spent almost 25 years in the industry doing CAD management, engineering, IT management. So I've got a little bit of background in a lot of different areas.

To get us started, to get us going and get everybody involved here, how many people are at their first AU? How many have been more than five? Ah, we've got a nice mixture in that room. That's excellent. More than 10? Now I'm nervous. You guys got me beat. This is the fourth time I've spoken and this will be my ninth AU, second as an Autodesk employee. So let's keep us going here.

So what we're working with here is the-- my silly-- pardon me, my screen is not showing the way it's supposed to so I look like I'm completely defunct. I thought I could play without the-- OK. Whatever. My notes aren't showing up so I apologize. I'll have to remember what I practiced.

So what we're going to do is we're going to look at some more of the interesting opportunities that have been given to us with Civil 3D 2017 with our corridors, specifically as the feature line options. One of the other things is, and let me take another quick poll here, how many people are using 2017 currently? Excellent. '16? There's the rest of the room. How about '14? Few of

us still. OK. Excuse me, I missed '15.

'15 Gave us the ability to target, off set-- or to add frequencies at offset entities. And so that's a very powerful part of what we're going to show here. So the guys that are in '14, from my perspective, there's not a lot difference between '14 and '15 as far as the impact to your workflow. Your IT staff might feel differently. I recommend checking it out if you can. Or go all the way up to '16.

Now, I do want to remind everybody in the room, you probably already know this, but 2017 changed the object type. So you cannot go backwards. '13, '14, '15, and '16 were more or less forward and backwards compatible. 2017 we added some new functionality that made that not available. Or that change necessary, I should say.

So we're also going to look in why we want to use additional baselines in regions inside our corridor. I approach it from a put all the information that you can in your corridor, that way you only have one thing to worry about. And that works about 80% or 90% of the time for me. I do have other times that that's not going to function correctly or I just have to look at something a different way. I'll create another corridor if I need to.

I also want to talk about how we can use generic links and conditional assemblies to add more power to the corridor to extract information that we can then add right back into the corridor. And then we're going to learn how to expand the usage of our model. What can we do with our model after we're getting it built? We know that we can build parts of the components and then use that information to build more and then use that information to continue building on our model.

Click. Wrong way. I don't know why it's bouncing around like that. I'm going to put the stupid clicker down and use the keyboard because that'll work. So the data set that we've got was graciously provided to me by Washington County, Oregon. This is actually a project that I worked on when I was employed as a civil engineer. The out-of-the-box comment does come with a few caveats. I am using service pack 1.1 and I am using the-- oh, my goodness, what do we call those now? The V-1 enhancements, sorry. We've changed the name of some of the extra tools that we've given you and I got away from saying productivity tools or productivity packs.

And like I said before, it's important to remember that this is just one approach. If there's one good way to do it, there's three other good ways to do it. The way that works is the best way

for you. Now, with that statement, I also encourage you to be open to some new ideas because I can learn from a phone call or support call just as much as I hope to help the customer when I'm on that support call.

So this is, I consider, an intermediate level class. And I say that because we're getting a little further than just creating a corridor, a baseline, some surface from that and some sections. We're actually adding some complexity to our corridor. Now, this is not an advanced class by any stretch, so my level of what I feel is intermediate might not be the same as yours but bear with me.

And one thing I did forget to say is I do know that they were kind enough to schedule the happy hour at 4 o'clock. If you would like to leave at 4:00, I'm going to do my absolute best to get through most of the important content by then because I absolutely understand. So please feel free.

So we're going to talk about our sub-assemblies and one of the things I want to say, and I know that people have heard me say this before, the sub-assembly help menu is the absolute best help menu I've ever used. It gives you almost all the information you need about a sub-assembly. I go as far as printing the information that I need and then making notes. I have-- I still have it-- a folder full of all the notes that I made about sub-assemblies because I don't remember some of the intricacies about each sub-assembly, especially your generic links, all the time. So it's nice to have a refresher.

So we want to get into learning about our sub-assemblies here, and we're going to focus right now-- we're not going to use the marked points right now. That's something that John's actually got-- I think it was John, maybe it was Jerry-- got a really nice class on YouTube that talks about using the marked points. I tried to integrate them into this particular session but it seemed like it was going to take us off of the tasks that I wanted to share.

So what I'm going to use is the links to surface and offsets and elevations. And I find that those are very powerful for a lot of different reasons. And more reasons than I'll even cover. Some examples are you can sample a slope of a road using links, send that slope into your lane, now you're lane-widening matches the slope of your road. It's pretty much that straightforward.

That's it. Class is over. I know that everybody's been PowerPoint-ed to death and I did promise there were some videos. The videos did not go as well as planned. I kept having little technical difficulties so we're going to do this live. A little Rodney Dangerfield moment here.

Bear with me.

AUDIENCE: [INAUDIBLE]

SEAN HULBERT: What? Other guys are doing this live? I went from lab to live to then push button demo. Next year. So here we go. Let's jump right in, and like I said, we're running with the out-of-the-box information except for those couple of caveats that I've given. And now I've got to figure out what's going on with my monitor because I can't see. There we go.

AUDIENCE: [INAUDIBLE]

SEAN HULBERT: No. I know. And I had it-- I swear I had it work in about 30 seconds ago.

AUDIENCE: [INAUDIBLE]

SEAN HULBERT: Any ideas, Michael?

MICHAEL: [INAUDIBLE]

SEAN HULBERT: I don't want to waste time.

MICHAEL: [INAUDIBLE]

SEAN HULBERT: What was that?

MICHAEL: [INAUDIBLE]

SEAN HULBERT: Oh, yeah. Good idea. Now it's screwing with-- it's messing with the resolution. Sorry. Oh, my goodness. This will not be fun targeting the corridor from the backside.

We'll get a tech guy in here in just a second. Sorry, everyone. Can't believe this happens every year. Yeah. It's not working. It sees that thing as a third monitor. Every year.

This is-- OK. We're going to get going because I know that we're short on time and I'll just flip to the other side of the table. It stopped working.

TECHNICIAN: I heard. Tell me what's going on.

SEAN HULBERT: It's not--

TECHNICIAN: Image [INAUDIBLE]?

SEAN HULBERT: --duplicating. Duplicating. Yes.

TECHNICIAN: OK.

SEAN HULBERT: And it was working when they were in here earlier.

TECHNICIAN: Let me take a look. Watch out for that.

SEAN HULBERT: Let me grab this.

TECHNICIAN: Sure.

SEAN HULBERT: OK. Sorry about this, everyone. Anybody have any questions yet?

[LAUGHTER]

Fielding questions.

AUDIENCE: Talk about the new features of the [INAUDIBLE].

SEAN HULBERT: The new features-- well, the targeting feature line-- or using feature lines for a baseline is one of the most powerful things we can do. It gives us a lot of flexibility. It's definitely something I encourage you to look at because it's-- there's always been that moment, it's like, I don't want to create a profile for this because it doesn't really follow any real geometry. It's kind of a-- I think of ponds immediately when I think of this. Because we have to do all these complex shapes on ponds and we want to have these ponds be intelligent enough to where we can move them up and down. So that's where I definitely see the power of that particular feature.

And again, the ability to add additional frequencies with your offset control. That's another very, very, very powerful tool. Again, that was introduced in '15. And then, if you were able to get into any of the preview sessions, there's exciting things coming. No good?

AUDIENCE: Sean, we have [INAUDIBLE].

SEAN HULBERT: Oh, I'm sorry.

AUDIENCE: [INAUDIBLE]

SEAN HULBERT: So the comment was is that we need to add data shortcuts-- or add feature lines to our data

shortcuts list. I definitely agree with that. How about parcels? Now that's another new feature that was '17 gave us. They all kind of blend together after a while. But that was the ability to data reference your corridor in 2017. That's a big feature. I can't believe I did think about that one first.

There's first time. I said 30 times I'm going to-- oh, second? See? He's counting for us. No. I said if I trip, I want a nice clap.

AUDIENCE: [INAUDIBLE].

SEAN HULBERT: If I keep stepping on it?

TECHNICIAN: [INAUDIBLE]

SEAN HULBERT: No. I want AutoCAD. Just AutoCAD.

TECHNICIAN: [INAUDIBLE]

SEAN HULBERT: I'm so terribly sorry, everyone. He's got us covered. I'm not kidding. I can sit like this. I mean, this is the last class. We want everybody to get a good experience here. You don't want to go with a sour taste in your mouth. And that wasn't directed at you at all. Sorry. So anybody-- go ahead.

AUDIENCE: [INAUDIBLE]

SEAN HULBERT: That was '15.

AUDIENCE: [INAUDIBLE]

SEAN HULBERT: Oh, yea. So does everybody understand-- when you're adding frequencies to your line work, it works the same when you're adding a polyline to a surface as a break line. Everybody understands what that mid-ordinate is, right? The smaller that mid-ordinate is, that's the perpendicular distance between a tangent line from each-- from the PC to the PT to that midpoint on the curve. And the tighter that gets it's adding a lot more elevation points for you as you go through that import process or as you're sampling your corridor. It gives you the ability to kind of automate the increased frequency that you need to get a prettier surface.

What I like to do is set all my frequencies to 50 or 25 or something silly, get my corridors built, get everything laid out the way I want them, and then crank all those down. I'll also use, like I

said, I'm using a multiple corridor environment here. Or excuse me, multiple baselines in my corridor environment. So what I'll do is I'll toggle them on and off constantly. And you'll find that toggling the corridor off, rebuilding your corr-- toggling a baseline off and rebuilding your corridor can give you the ability to correct some hiccups that were happening in your corridor.

I can't tell you why. I couldn't read the code if somebody gave it to me. Are we ready?

TECHNICIAN: Yeah. If you want to pull up your demo.

SEAN HULBERT: Absolutely.

TECHNICIAN: [INAUDIBLE]

SEAN HULBERT: We're on fire.

TECHNICIAN: Good sign.

SEAN HULBERT: Thank you, sir.

TECHNICIAN: OK.

SEAN HULBERT: Thank you very much. I appreciate it.

TECHNICIAN: [INAUDIBLE]

SEAN HULBERT: Did I hit '14? Well, we've got 14 people in the room. Didn't you guys want to see this?

TECHNICIAN: But I think [INAUDIBLE]

SEAN HULBERT: I actually already had those open. I didn't even realize that. Those logos look so similar each year.

TECHNICIAN: [INAUDIBLE]

SEAN HULBERT: Oh, no.

TECHNICIAN: [INAUDIBLE]

SEAN HULBERT: Alt-Shift-M.

TECHNICIAN: [INAUDIBLE]

SEAN HULBERT: Yeah.

TECHNICIAN: [INAUDIBLE]

SEAN HULBERT: It's not what we want it to be.

TECHNICIAN: [INAUDIBLE]

SEAN HULBERT: I don't think it's where we want it to be. Did InfraWorks come up? OK. InfraWorks is working.

TECHNICIAN: [INAUDIBLE]

SEAN HULBERT: I can't believe this. Want to do it in InfraWorks?

TECHNICIAN: [INAUDIBLE]

SEAN HULBERT: Say that again.

TECHNICIAN: You have still [INAUDIBLE] one direction a few times and see if it pops up.

SEAN HULBERT: Yeah. I was trying the Alts.

TECHNICIAN: [INAUDIBLE]

SEAN HULBERT: That's not it. I did '14 again. That was dumb, Sean.

[LAUGHTER]

At least we're getting a laugh today. Nobody saw a comedy show this week, did they? I'm happy to provide one. So '14's working. I'll break the monitor again and we'll be right back where we were. This is insane.

Can I grab it right there? It's lost. New CAD opens up on the right monitor, this CAD doesn't. This one won't open up on the correct monitor.

AUDIENCE: Oh. Well, he's coming back.

SEAN HULBERT: I hit the wrong CAD. It was open still.

TECHNICIAN: So did it screw up?

SEAN HULBERT: Yeah.

TECHNICIAN: The image is all--

SEAN HULBERT: No. No. AutoCAD's not showing up on the right-- it's not at all. Gone now. It's on the third monitor. We're thinking. Sorry.

TECHNICIAN: Well, second monitor. [INAUDIBLE].

SEAN HULBERT: Ah! OK. So let me re-hear that question again.

AUDIENCE: With the horizontal-- we utilize the horizontal [INAUDIBLE]--

SEAN HULBERT: Right.

AUDIENCE: Our [INAUDIBLE]--

SEAN HULBERT: Right.

AUDIENCE: --so we're doing [INAUDIBLE] and all that [INAUDIBLE] transition from a typical curve to a drop curve, you can actually set up a frequency that [INAUDIBLE]?

SEAN HULBERT: Yes.

AUDIENCE: If you have '16. I'm wondering if that functionality is better in '17 so the whole drop [INAUDIBLE] and then the whole typical drop down [INAUDIBLE] overlapping--

SEAN HULBERT: Right.

AUDIENCE: [INAUDIBLE]

SEAN HULBERT: And it's triangulating poorly. That one I think needs, and I've done this with a sub-assembly composer, actually created a curb, that we dropped through a region. So we'll tell it at the beginning the region it's six inches, at the end of the region it's zero, and it actually does transition great. And on-- I don't know if you heard me talking earlier-- but there's a Project Chameleon that's out that is a content composer for Civil 3D.

It was intended to be for piping content and then some of our customers took it way beyond what we expected and their building sub-assemblies with it. So that's an encouraging-- now, I can't speak very intelligently about it, but from what I understand it's a lot easier to work in than Sub-assembly Composer is.

AUDIENCE: Because we don't want to have to--

SEAN HULBERT: Custom.

AUDIENCE: [INAUDIBLE] regions.

SEAN HULBERT: Oh, not multiple regions. Sure. Sure.

AUDIENCE: [INAUDIBLE] horizontal [INAUDIBLE] to justify splitting out [INAUDIBLE].

TECHNICIAN: Which one is [INAUDIBLE] demo?

SEAN HULBERT: This one right here. I am so sorry. [INAUDIBLE]. I'm grateful for your help. What was that?

AUDIENCE: Just add another horizontal [INAUDIBLE] target in there so that at this point it doesn't ramp down and then the next one is the whole [INAUDIBLE].

SEAN HULBERT: Yeah. That's a great idea.

[INTERPOSING VOICES]

Hey, there it is!

AUDIENCE: Don't let it go! It's so close.

[LAUGHTER]

TECHNICIAN: All right. You said you'll sit over here and do it.

SEAN HULBERT: Yeah. Does anybody have a problem with that? I can't look at you people but--

TECHNICIAN: Might like it better.

SEAN HULBERT: Yeah. You don't want to look at me, huh?

TECHNICIAN: All right. Give that a shot. Do you need a chair back there?

SEAN HULBERT: Yeah. I will.

TECHNICIAN: I don't know if this is going to help you.

SEAN HULBERT: Oh, no.

TECHNICIAN: Yeah. You know what I mean?

SEAN HULBERT: Well, I need the keyboard, though.

TECHNICIAN: Oh, right. Right. [INAUDIBLE]. Here. Take a chair.

SEAN HULBERT: Thank you. Thank you for your patience, everyone, I'm truly grateful. So here we go. Let's get this party started. Oh, that's blurry. The open dialogs on the wrong screen. Yay.

So one of the things that I'm going to introduce here as part of this-- OK. I got to fix this. There we go. I can't have to go all the way over there to get to here. So one of the things I'd like to do here is I have set up a little bit of pre-work just because I don't like to make you guys wait while I do all the monotonous steps. So I like to go ahead and create my surfaces-- well, I've got my EG surface obviously-- but I like to go ahead and create a FG surface with a data short cut if I can from one of my parent drawings.

It'll be an empty drawing, so we'll go ahead and we're just going to start off by creating a corridor. Uh oh. They're going to say, why is he on the wrong side of the table. So one of the wish list items that I'd like to see everybody vote up is you should be able to create a corridor by right clicking on Corridor.

AUDIENCE: Yes. [INAUDIBLE]. If you could post a link to that on the class schedule [INAUDIBLE].

SEAN HULBERT: Oh, and there's no-- silly, Sean, I forgot. So let's just get this going right. I'm going to go and bring in my X references which is on the screen. We've got our Topo here. And I'm going to strongly recommend that you use much better drafting standards than I'm going to use for the class. I know you guys don't have time for me to sit here and put everything on the correct layer. We can all put it on layer 0, right, just for the class.

I don't recommend doing that at your office. And then one of the things, and I tried to look this up and remember when we added this particular feature, but one of the things I like best about the recent releases of Civil 3D is that we can drag and drop-- let me go and get this guy open in the background-- we can just drag straight from our data shortcuts all the information that we're needing into our drawings. I go down here, I grab my profiles.

Now, I don't necessarily need the EG profile for every one of my profiles so I try to limit when I bring those in. Let's go ahead, we're to start with Venetian Way. And you see how I geeked out and named everything after where we're at. I was going to do it the way I didn't say I was

going to. There we go. I think that's a great--

AUDIENCE: [INAUDIBLE]

SEAN HULBERT: Is it '17? I should of brought swag for all the people that are answering the questions I should know how to answer. And for whatever reason I've said all my things to bring it in and it's proposed when I drag it, but it's not behaving well. So we'll get our alignment in here. We've already got our profile in here because the alignments in here.

I'm going to go up here and is it going to let me? It's going to let me. Corridor. That's hard to read. Venetian Way, EG, no assemblies yet. Target surface. Don't need to target a surface because there's nothing to target. Go ahead and create that corridor.

Go ahead in here. In the wrong screen. Give me a second here. I got ahead of myself. I didn't bring my assemblies in yet. We'll go ahead and creates those from scratch. Like I said, it's more or less live. Little bit of Memorex. Bad joke.

I love creating my assembly grids like this, keeping everything simple. The first thing we're going to talk about is, as part of the struggles that we have in design, is we're constrained often. Right? Our design criteria is going to control our costs, it's going to control what we can build, it's going to control how we build it many times. If we're constrained by right of way and we have to keep all the building construction in the right of way and the roads open, now we've got additional challenges.

So one of the things we can do with assemblies is locate elements inside our-- or use our corridors with these assemblies to locate elements that are part of our design. So I'm going to go ahead and I'm going to name this guy Right of Way. I'm going to come over here to-- this is the part that should have been done by now-- I wanted Surface. I'm going to link-- let me get this over here. Please remind me to share my information with you.

I'm going to link an offset to the surface. And I'm going to use-- I'm going to link an offset to the surface and I'm going to use that to identify where my right of way is at. Actually, got ahead of myself again. I tell you what, the little glitch there put me off my game. Horizontal targeting. This is one of the tools that I think gets used entirely too infrequently in Civil 3D.

This gives us the ability to add or not add elements of a corridor-- or elements of our assembly based on drawing elements, simple polylines, alignments, alignments, or-- what else, Tom?

AUDIENCE: [INAUDIBLE]

SEAN HULBERT: Feature lines. Thank you. I knew I was forgetting at least one. So we're going to take this condition, we're going to modify the condition. Now, one of the things that I like to say is, as part of your design, you're going to sketch out-- you're going to have a typical section for your road section in most cases, you're going to have a cross section for what your ponds going to look like.

So what I encourage is that we name our elements even on that cross section. Just write it-- and I'm old so I like to still write things down on paper-- write it on your iPad or whatever you like. But keep notes on your typical section so you know what these elements are called. The hardest thing in the world when you get a very complex corridor is to keep track of the elements that you're targeting if you haven't named them properly. Because conditional horizontal target one, two, three, that really doesn't help us.

And I'd like to go over here-- now, remember, these are just lay out-- this is just layout information, so when we're modifying this we're not actually modifying anything in our design. And I kind of like to make it steep and I like to limit my maximum distance because sometimes you'll get unexpected elements inside your corridor and it'll throw your cross-sections out to a size that's completely unreasonable. So we'll take this down to about 200 feet. Right of ways never bigger than 200 feet in this particular section. And there we go.

We're going to add this link to the surface because all we've done is said, if there is a right of way line here, add-- we haven't said anything else so we're going to have to tell it what to add. Come over to our generic links. We're doing Link Offset to Surface. Let me go in here and add this guy. Back into my corridor-- or excuse me, my assembly box. Slide this guy over. This is going to be fun. And I'm going to rename that Right of Way. And I'm going to come over here. Is it the link code that I'm going to need? No, it's point code. We're going to name that point code Right of Way. And this is the part where I've changed my codes. Inside my codes, you'll see that I've added Right of Way. And then we're going to create a label that when the right of way shows up we get a little flag that shows right of way.

And the reason that I like to do this-- part of the demo is I was going to do some dry utilities. Obviously we're not going to get to that particular part, but you can expand this. We've used this to target where that dry utility is because we don't really have inverts on gas lines and fiber optic lines and electrical lines, but we have potholing a lot of the time. So we'll target over to

the surface the existing surface where that element is, and then we'll use our pothole data to target it vertically. We'll link a vertical link to that element and then we can label our gas lines and our sections quick and easy. We don't have to create pipe networks, we don't have to go any further than targeting a polyline that is a gas line.

The right of way is going to function the same way. So just take what you're learning and just push it to that next level and teach next year because I'd love to sit in on a class. Tom. I'm going to pick on you all day, Tom. So why is my link not showing up? Having a hard time seeing that. Let me turn my screen color here. I don't want white. Where is it? [INAUDIBLE]. Oh, duh.

And we do want to omit the link because we're not going to want to see the link, we're just going on to see the results of the link. And there we go. Hands on the wrong side. This is the fun part. And assemblies-- or sub-assemblies-- sometimes it's left and right, sometimes it's positive and negative. I wish we would make up our mind.

We're going to go ahead-- oops-- select both of these guys and mirror them. About right here. There we go. So now we've got an element. We've got to fix this. Now it's the other side.

And do we have something reasonable for a name? Let's call that Right of Way Right. And I should have called this one Right of Way Left because, again, it's no fun to try to target when these aren't set up correctly. Or not named correctly, excuse me.

We'll go into our point codes, and what I'm going to do-- might do it here-- I think they're built in. I cheated. Ah, I got burned. So this should have already been built-in. It should be here. Label, Right of Way. And I'll show you what this guy is so you don't think I'm doing you wrong.

Oh, my goodness. So basically all we've done here is we've got a line with a point code in it, and the point code's going to be told to call the right of way. Let me get out of there, we've got that already signed, there we go. Here we go. OK.

Come over to our tool space, get our corridor again on Venetian Way. We're going to go ahead and add a baseline-- or a region. So going to call that region Right of Way and we're going to use the right of way. And this is where we're going to do our targeting. This is the part where I was having some technical difficulty with the recordings.

So what we're doing here is we're saying, if the right of way is found, we're going to drop this label. And if it's not found it's an intersection. We don't have to worry about it, right? We've got

a different set of concerns. Let's go ahead and do this.

Now, can't remember exactly what version that we introduced this but it's working much better now where we can target-- uh oh. Let me get my screen split here. There is definitely an issue I'd like to share with you about this particular process. If these screens are split, sometimes we'll get disconnected line work. It's purely graphical and more annoying than anything else.

Let me get some of this garbage out of the way so I can see what I'm looking at. Let's get our LT scale set to something real. There we go. So now let's just get this targeting started.

We've got our baseline. Go ahead over here to our targets. And-- oops-- I did that again. I haven't brought my surface in. I'm going to select this from the drawing. I'm selecting a polyline. That's the hard part, is that you do have to make sure it's polylines. And sometimes you'll run into some challenges where the polylines go around the corner, kind of return on themselves. Make them polylines but don't make them connected polyline lines in that particular scenario.

And what you're going to see here-- that's not a polyline. What you're going to see is I'm going to, when I'm targeting later on my lanes, you're going to see I'm going to go ahead and grab all of my polylines through these areas because I like to use the Copy Regions feature. I like to-- I don't see it being monotonous information. If it's not there it's not going to target it, it's not going to impact our design. But it's going to allow us to get our process started much quicker, and if we want to go back in and clean it out later, by all means. We've all got two monitors so we can see everything now.

So that's actually looking for it. Now we're going to actually tell it where to be. Because we did look for the right of way, now we have to tell it to find-- to label what we found. We'll skip that part that's not working for us. I don't want to waste your guys' time. And here we go. And we'll do the-- oops-- we'll do the other side now.

And here's another awesome opportunity for the ideas forum. When we are selecting targets, we should be allowed to select multiple targets at the same time. The selecting the conditional assembly, you then have to go in and select the width assembly. You should be able to select a selection set maybe. Does anybody-- is everybody following--

AUDIENCE: [INAUDIBLE]

SEAN HULBERT: I'm not a fan of the bilayer. I know that it's--

AUDIENCE: [INAUDIBLE]

SEAN HULBERT: Let me take a step back. Calling me out there, Tom. Great. What I would say is that, when I generally do this in live work, I don't think I would use the X Reference option. I wanted to show it because it's working better now and it's a great tool, but I liked it, like Tom says, I'll name all of my targets inside my drawing. And the advantage I think that gives us is that since you've already got the polylines in the drawing, if something is later changing in your design, you can take that polyline that you're targeting, turn it into a feature line and give us some more intelligence. So it's already there.

Now, there's some targeting that will have to go back on and things but the information you need is there. Now the flip side of that is that when somebody changes something in your 2D drawing, all bets are off.

AUDIENCE: [INAUDIBLE] bilayer by selecting a point-- selecting a polyline, it creates a polyline number class to it.

SEAN HULBERT: Yes.

AUDIENCE: It'd be nice if Autodesk, you can go by layer wildcard. So anytime you added an additional layer, it's automatically updated versus having to go back in it, click and add another number.

SEAN HULBERT: Absolutely.

AUDIENCE: [INAUDIBLE] number so they just need to add the wildcard.

SEAN HULBERT: Absolutely. Great idea.

AUDIENCE: [INAUDIBLE]

SEAN HULBERT: Right. So this is what I'm talking about here, is I should be able to hit Previous-- and it still doesn't work. I was hopeful it got put back because it did work I believe in '15.

AUDIENCE: [INAUDIBLE]

SEAN HULBERT: Thank you. Another great one. That one-- I'll give applause to that one. This is the part that we shouldn't have to watch but if I just double up-- that's what I get when I try to talk and do this at the same time. And I'm going to-- this is another thing I like to do. I toggle this on and off

constantly.

That is a horrible color. And nobody reminded me that I forgot my surfaces. Go ahead and bring this guy in. And we don't need to see the existing ground. All that does is cloud the picture here for me. And there we go. One more step here in our corridor and our feature lines-- our corridor is going to show up.

How did it get into a section view? Oh, we're not showing anything. Duh. I turned off my links. Duh.

AUDIENCE: [INAUDIBLE]

SEAN HULBERT: And I had turned off my links so I'm not seeing anything [INAUDIBLE]. Sorry about that. It's much easier to see this on a black screen. I apologize for this horrific color. So what we're going to do here real quick, we'll just go ahead and look at them on our Section Editor. That'll be easier.

No. No, it won't. Because we're not in the right part. I cannot see those numbers, people, I am so terribly sorry. This is silly, silly, silly. Let's just create the sections then. OK. Tool bars on the wrong screen again. We're going to create by range of stations. This is the basic parts of the class. Sorry, everybody.

We'll do it at 50 feet. There we go. Now we've got some data. Cross-sections, create some views. There's our right of way. So again, and you're going to see it in the variety of our sections here-- jumped to the middle for some reason, I think I got a busted right of way line in my sections.

And again, like I say, we can apply this same part to a dry utility power line. Above power lines. We can locate anything in our plan by using this step to add them to our sections. So that's the-- and I'm sorry I'm going really quick on this part. I do want to give you the opportunity to get through as much as we can with that massive delay.

Let's see here. Maybe my sections aren't wide enough. Let's go ahead and increase our frequency. Here's that-- whoops. Here's that part I was talking about with the frequency. In our dialogue box here, we could tell it to add offset geom-- we can add offsets at different-- at the offset-- add frequencies at the offset geometry points. Wow. That's not easy to say fast.

And here's by increment or by curvature for the additional sampling as we go around curves on a mid-ordinate distance. I like to do the same thing up here, too. I actually prefer to use both because I do want my sections every 25 feet or whatever my base frequency is, but I also like that tight cleanliness that gets provided with the additional frequencies.

AUDIENCE: [INAUDIBLE]

SEAN HULBERT: In what? No. Not in Object Viewer

AUDIENCE: It won't?

SEAN HULBERT: No.

AUDIENCE: [INAUDIBLE]. I see the benefits [INAUDIBLE].

SEAN HULBERT: Yeah. No, that's a great idea. It won't work in this particular workflow but I'm sure that we could come up with a way to get that to actually function right. So I'm going to go over here-- what we're having the problem with right now-- not a problem but-- is that our sections just aren't wide enough in some areas. I thought I had made that 100 feet but I did not. Properties-- yep. That was my mistake. It was supposed to be set up in the settings to be 100 feet not 50.

AUDIENCE: [INAUDIBLE].

SEAN HULBERT: Thank you. Come on. New way to write 100. I did it twice. There we go. And there we go. Yay. We got a right of way.

So some of the pre-settings that I set didn't work correctly. I do apologize for that, but it is live. So now we want to get started with-- this is where I go into my part with the gas and we can show that if there's a little time there at the end. But I want to go ahead and I'm going to take another cheat step here just so I can get the most-- so you can get the most out of this class possible. I'm going to insert some assemblies.

There we go. And that's going to mess up our corridor there, isn't it? So here's our gas. You'll see that I actually do have the gas targeting. I did practice this class before I came. So that will mess up our corridor over here. Let me go fix that real quick. Well, we've seen that work. We'll take that out for right now.

And now what we're going to work on is we're going to work on adding our main roads to our design. Now, when we insert Civil 3D objects from a block, we add numbers to them. It drives

me insane. I know why it does it, because it comes in as a block. It gets the object is in the drawing, then it explodes it, it has to add it as-- we have to bear with it. It's just an annoyance. It does make me furious.

We've got an assembly here, we've got the wrong profile, and we make sure our frequencies are in check. And again, I do say that I generally save this till the end but I'll forget to come back and then look silly. We're going to start setting some targets.

Now, let's talk about our assemblies first. I didn't go into that because I cheated. What we're going to do here is we're going to build a lane and then we're going target curb. And we're going to say, if this is-- excuse me, this is not found-- if there is nothing found, continue the process. Add our curb, add our sidewalk in daylight. If you do find something, don't do anything. Stop at the lane.

And what that means is, as we go through an intersection, we're going to drop the curbs. So it's pretty straightforward, pretty simple. Let's get back in here. Just a targeting effort. And this is, again, where you're going to see the monotony of targeting. Here's all the information that we're going to have to target for our cut and fill. I've got a lot of information going on here.

Let's minimize that. Well, we'll go ahead and add them. Takes nothing but a second. We're going to target EG for everything. And all we're doing here in our daylight-- I did fail to explain this-- is that we're saying that, if-- we talked about in the beginning of the class that we were going to use some of these conditional targets. I'm going to take a step back here. Does anybody use conditional targets right now? I know a couple of us do.

Look into conditional targets. These things are awesome. I'm not a big fan of some of the pre-canned sub-assemblies just because they're not as powerful as what I want them to be. So what I've done here, here is our horizontal target saying that if you don't find anything add our sidewalk, our curb, and then we're going to come over here and we're going to add vertical conditions. And what these vertical conditions are saying is that anything over three feet a cut we're adding a wall and anything from one to three we're going to go-- I believe that's a 4 to 1 slope.

And again-- excuse me, that's 2 to 1. Again, the layout information that's provided in our conditions is purely graphical on the screen. It does not impact your design. All it's doing is giving you the ability to create-- somebody said a spider web. Yep. They definitely look like spider webs. We can get these corridors to be extremely complex and this one's not complex.

One of the other things you'll see here is that I'm working on one side of the road only. In my work, in my career, I did a lot of transportation work, a lot of rehab on roads. Intersections don't ever line up at 90 degrees. Intersections are always staggered at some horrible staggering that makes it impossible for us to do our job. It's just-- it's frustrating. So what we'll do is we'll just have to-- we get creative, and we're going to build our own intelligence into our assemblies here.

We're going to go ahead and we're going to grab our assembly. We're going to target the left information. Minimize-- and this is another thing, when you minimize it it should stay that way. With target, target offset. So here's the target not found. I did forget to go in here and draw my lines. And at this point in time, I don't need my topo anymore. I'm going to unload it, make it cleaner.

I'm going to come in here and I'm just going to add a feature line. And I choose feature lines for this object-- for this particular process instead of a polyline because at some point I imagine the feature line-- or I'll have to add some elevation information to this line and I won't have to re-target it if I do use that feature line to begin with. And we're just going to start this here at the edge of curb, assign the elevation, Enter, go to the curb, Enter.

Now, once that corridor's built, I'm going to take that feature line and I'm going to get some elevations from the corridor. So here we go. We're starting to build a model that's going to give us information to add to the model to give us more information. So we're just going to keep taking it to the next step.

Same thing. I'm to go down here at this intersection because I'm going to need that in just a moment and we'll go ahead and get it done ahead of time. Yes, I geeked out on the names. Sorry. It's more or less to just not tell you exactly where the roads at and where-- [LAUGHS]. We got that guy, Enter, and we're done.

We'll go ahead and target our information here. One of the things that I like to do is, if you right click on-- if you grab your corridor, right click, we can get to most-- all-- of our corridor features here except for creating a new one. We can actually-- let's go ahead and bring in some more line work. You see the jagged? That's all graphical. It's even worse on this screen so it's not going to be that bad on your machine.

You'll see polylines that just do this. They're fine. You label them, you list them. I've gone

through hours of trying to prove that they were wrong and they're not wrong. They're fine.

AUDIENCE: [INAUDIBLE]

SEAN HULBERT: Thank you for reminding me. You're absolutely right. If we go over here to our graphics performance-- and I can't see it because it's a quarter mile away. There it is.

AUDIENCE: It's on the bottom.

SEAN HULBERT: There it is. I thought I had it turned off. Turn off your high quality geometry and the curves won't freak out. I think we're dealing with a projector issue here or some more video fun. Have to watch my mouth. I was a surveyor for quite a while as well. Not licensed but in the field so I learned things that sailors don't know.

Here we go. Moving right along. So now we've got this. One of the coolest things that I learned is that we can create a corridor this way. Can't we? Oh, I lied. Oh, no. What it does-- I'm sorry-- if we create the corridor by selecting the polyline first-- there we go-- it assigns some information for us. If we create the corridor by selecting the alignment first, it gives us some pre-filled in information. Not super slick, not super fancy, but something to consider.

Moving right along here. We're going to target-- we're going to target our corridor. And here you'll see I'm going to do that same thing that I did before with right of way. I'm going to go ahead and jump across all of what is going to be future regions. Now I just gave it away. We're going to have some more regions but we all expected that.

So I'm going to select that-- no. No. I'm going to select Not Found. So we could have done it either way. You want to select your curbs to find the curbs, you could have gone that way. You want to select a line that's crossed the intersection to indicate that there's no curb, we can go that way. Lot of different ways that we can approach this. I feel that it's easier to select less information.

Now we will have to break that inter-- we'll have to break through this intersection and another region. That's why I'm going to jump over here and grab-- whoops. Grab that one. That light gray line for the back of curb is almost impossible to see. We'll say OK.

And we've got some targeting on the sidewalk. We're going to come back and do that in just a minute. We're just going to go ahead and get this process done. My corridor is a little bit too long. [INAUDIBLE] there. OK. We'll just grip this guy back here and about right there.

I really like that feature in corridors now. We can move these around a lot better. One thing I'll caution you is that, as you're drawing gets more complex, this will become more-- or harder to complete. Another thing I love to do is I hide this. When my corridor gets so complex that I can't select things, I'm going to go ahead and hide that object. And then the only disadvantage now is I have to come over to my tool space to grab my corridor.

But the advantage, I feel, is that you can actually see the information you're working on on the screen. So we're going to call this Venetian Way. Nobody caught that I was poor on my naming here.

AUDIENCE: [INAUDIBLE]

SEAN HULBERT: Yeah. And sometimes you'll have your corridor sitting on top of your line work and it's not letting you select the line work that you want even if you're using your selection cycling. Which is a great tool, but it also slows everything down. And we have a tendency to get in a hurry. Go ahead and add that other baseline. Alignment, Venetian Way, don't know why it's calling it Swale.

OK. We're getting close to 4 everyone. Anybody who wants to go, please feel free. I do profusely apologize for the hiccup there at the beginning. I'll answer any questions that you have, if you do have the desire to leave. We're going to go right on that one and we're going to go add these targets again. So again, this is the part that, like I say, is monotonous.

Should have left that dialog box open. And again, we're targeting our width and we're going to target our offsets. Did I forget to target the width last time? No, I didn't. I did. So here we go. We're going to select our-- that gives us all the line work that we need. And let's go ahead and un-isolate our objects. Doesn't sound like a real word but apparently it is.

And there we are. We've got our corridor-- general concept of our corridor-- and you'll see that we've got no information going on right here. One thing I failed to do is I'm going to use that feature line as one of my targets for width as well. So it's got a dual purpose here. Feature line is indicating where there is no curb but we also want to target it for width. And that will drag us back out there.

And one of the things I said at the beginning of the class is I like to get this surface created early. And the reason I like to get my surface created early is because it's going to give us that design information. Again, we're putting model information in, taking model information out, to

put more information back in. I'm being redundant and I apologize but I think it's an important part of the process.

I'm going to go ahead and save my drawing. Nobody reminded me to do that. Everybody's had a long night, long week, ready to go home. Well, we're not going to need the data shortcut because I'm going to do everything in this drawing. We're going to use-- so one of the things I failed to mention because we were kind of thrown off track there is that drawing names and working with the way that we name our objects-- in the company I formerly worked in we called all of our Civil 3D object drawings DR for Data Reference, and we called all our x references XR for X References. And the important part of that is, is that we kept everything that was Civil 3D in the DR drawings to the best of our ability. We only had 2D information in our x reference drawings.

One of the things that we found is that if you x reference and dereference from the same drawing a surface, it can give you some unexpected, unnecessary rebuilds. So it's rebuilding it for the x reference and it's rebuilding it for the drawing. You get a half a dozen surfaces in there and your drawing comes to a screeching halt. Oh, sorry. Yep. Let me move this mic up here.

AUDIENCE: [INAUDIBLE]

SEAN HULBERT: So if you have a data reference and an x reference coming from and going to the same drawing. Perfect example, topo. You x reference your topo in but it's also housing your existing ground surface. That doesn't create a big upset. It's when we start duplicating this and having it happen three, four, five, six times. Those surfaces are rebuilding twice unnecessarily in the background. So your cursor sits and sits and sits and then-- and we've immediately cured that problem by taking the surface, putting it in its own DR drawing, bringing that in as a data reference and everything speeds up. Much better.

So you'll see I got a little funky line here. I'm going to bounce around a little bit because this is the part that I really wanted to show. So this is a swale that we would like to build. We're going to go ahead and create a feature line out of that swale. Swale. I'm going to erase the existing object. We're going to call it swale. And there we go.

Now, one of the things that you're going to need to know is that when we create a corridor using a feature line, it's based on the direction your feature line was created. So if everything

daylights to the inside and you're wanting it to daylight to the outside, or vice versa, grab your feature line-- and it's one of these tools over here which I can't hardly see.

AUDIENCE: [INAUDIBLE]

SEAN HULBERT: It's in geometry. Thank you. Ah, I hit it. There we go. This just reverses the direction. You can build the corridor, have it daylight to the wrong side, reverse the direction and it fixes it. So it's pretty intelligent, pretty cool tool. I failed to assign some elevations here. I'm going to take this guy here and we're going to [INAUDIBLE] some of our elevation tools. Where'd it go?

That's not the one I want. Gosh, I can't see the screen. Pick the tool, bring it back. It's this guy here. I'm just going to set a grade here. I know what these numbers are because I did it. Let's set this guy as 132.2. And I'm going to tell it to go all the way to here at 0.5%.

You can't do that efficiently with an alignment, in my opinion. That would have taken entirely too much time. Do it again, I'm going to start here, make sure that I get a good elevation. I do. I'm going to set my elevation all the way around. I'm going to set the slope at zero and call it good.

Going to start back on this side. We've got our elevation here. We're going to set that grade at zero because we know that it's flat across there. And we're good. I'm going to start here again. We've got that 132.2. We're going to go up to here, we're going to go grade-- whoops. This is a swale, water quality swale.

I'm going to start there. We're going to make this flat. We should add a feet elevation point here and we're just going go ahead and make this nice flat through here. That's flat enough. And these-- these aren't real numbers, people. I know that. Just for the process. We can lower that point and make it a little bit better.

We're going to go ahead and we're going to grab our corridor, go to our Corridor Properties, we're going to add a baseline. This time it is swale. We're going to add it from a feature line. Feature lines in site one, it's called swale. There we go. We've got our region to add. Swale. And we'll do some targeting.

Now, what's going on here is that once we get up near that head wall that you may have seen in the drawing, we're not going to want to keep targeting-- we're not going to want to keep daylighting. So let's get out of the dialogue box and go take a quick peek at our sub-assembly. There we go. That's quite a mess. Do I got a zero elevation in there? Ah, some weird one on.

But that's part of the design, right? It's an iterative process for a reason. So we're going to do some targeting. When the target's found, it's going to add this retaining wall. And we're going to have to bring-- no, we can do it here. Grab our corridor, grab our corridor, edit our targets. This is definitely my favorite way to get to that particular part.

Target head wall. Here we go. Now, we're getting some extra daylighting going on here and that's because we haven't set up our boundaries yet for surfaces. But this is where I'm going to suggest we go ahead and just collapse this guy down, turn these guys off, because that's not what we're working on. We're working on the swale. So keep your drawing as clean and simple as possible to make your life easier.

Let's look at our Elevation Editor. I must have a zero elevation in there somewhere. Yep. Thank you, Tom. There it is. So let's go ahead. I failed to send that slope up that way. My bad.

There are quite a few third party-- oops. That was dumb. Oh, it did work. Third party applications that you can add on to Civil 3D that make working with feature lines a lot easier. There's some really cool tools out there.

So here we've got our swale. That's a fairly complex shape, in my opinion, and would not easily be modeled-- that's a horrible screen-- would not easily be modeled with an alignment, polylines, so on and so forth. And we know that pond's are getting more complicated. We're adding features inside the ponds for water quality. Build that into there. This is why this tool was added. This is a very powerful feature of Civil 3D 2017.

AUDIENCE: [INAUDIBLE]

SEAN HULBERT: That's a great question. I would let it be driven by the corridor on most cases. Oh, sorry. The question was, is it best to change your frequency, add elevation points to your--

AUDIENCE: [INAUDIBLE]

SEAN HULBERT: And that's what my--

AUDIENCE: [INAUDIBLE]

SEAN HULBERT: Right. It's basically adding pseudo elevation points. So they're not changing horizontal direction. So the question is-- and correct me again if I'm wrong-- do you change the feature line for more frequency or do you change the corridor? My personal opinion would be,

whatever works best, but I would go with changing the corridor personally. Tom, did you have a--

TOM: The corridor just because you can do a larger frequency, and then as you get in a more detailed design, and then you get close and then you could add more frequency.

SEAN HULBERT: And you could also do it with a corridor and then supplement it with your elevation points as you're moving forward.

TOM: So if you did it with a feature line [INAUDIBLE]. Whereas if you [INAUDIBLE] corridors [INAUDIBLE].

AUDIENCE: [INAUDIBLE] feature line. Do you go to site and you can change it under how many times it actually [INAUDIBLE].

SEAN HULBERT: Tessellation.

AUDIENCE: [INAUDIBLE]

SEAN HULBERT: When you add it to-- when you add it to a surface.

AUDIENCE: Oh, so this won't

SEAN HULBERT: That's not going to fix you-- yep. Yep. Thank you. So the question is, would this impact the feature line that you're adding to your corridor? And the answer is, no. This is going to be only if you right click on that feature line and say, add to surface. Then it's going to go ahead and increase. And I highly recommend the 0.01 for this process too. It makes a nice, clean surface. Here we go.

Now, I do want to get into a curb return here so let's get that corridor back on. And this is the part that-- this is where we were talking about the surface. So Curb returns are monotonous. They're kind of a pain. It takes a lot of effort to get them done. With all the new ADA rules, they're getting even more complex.

We'll focus on the right side of the road here. Now you'll see that I did kind of get things moving forward and I did not target my sidewalk yet. I'll have to do that. And I failed to target my width here. But what I'm going to go ahead and do is I'm going to modify this region and I'm going to split it so I can add my curb returns.

And this is why I did the targeting of everything all the way across because it's already built in. I don't need it but it's OK. It's not going to cause any heartache. It prevented me from having to go redo it. Width, select [INAUDIBLE], there we go.

So what we're going to do here is we're going to bring in these curb returns real quick and I'll show you why I built that surface. Do I have them? No, I don't. Alignment-- oh, one other feature I forgot to mention. This is awesome. That is really awesome. We can add folders in our geometry. So we can come up here to-- I don't know why that's not working right. We can come up to our alignments, and instead of just having them broke out based on center line offset, we can create those folders in the sub-assemblies-- or, excuse me, in the shortcuts-- and they'll propagate through. Us

I lost data over here. Let's just go back to the one view. There we go. And like I said, we're going to go back over here, we're going to grab our alignments, we are at Phoenician in San Paolo. I don't like the fact that this isn't going to bring the profiles. That makes me furious. If I drag this over, all I get is my alignments. I don't see the purpose of that. Another great idea station or idea forums, whatever we keep changing the name to.

And I'm going to create some profile views real quick because we're going to go ahead and sketch out-- we're going to have to get San Paolo added to our model here. We'll go ahead and do that now. Oops. That's a surface not a baseline, not a corridor. See, this is a perfect example of things stacking on top of each other, making it hard to select.

Properties, Add as a Baseline. And as you can see, this is going to get extremely complicated. I don't have a problem with that myself. I am keeping track of everything that I'm doing, I'm documenting my process as I go through, both in the drawing and probably in some sort of a spreadsheet or something else I'm sharing with my designers. So if somebody else has to come in behind me, they're going to know exactly what I was thinking when I did a specific process. And we're going to do San Paolo. We're going to do that one left.

The CAD drafter in me wants everything to be all caps. And we're going to add a region and we're going to use our left primary road. And another thing with these conditional assemblies is it gives us the ability to have fewer assemblies. Conditional sub-assemblies gives us the ability to have fewer assemblies, which I think is a powerful tool.

There's nothing wrong with having multiple assemblies. Like I said, there's a number of workflows for every process that we're going to do here. Got our profile and I'm going to go

ahead and let it build it out real quick because I don't want it to crash on me and I haven't saved in a minute. There we go. As you can see, we keep adding information to our design, information keeps getting added to our model. Drag this guy back here.

OK. So now what we've got is we've got, more or less, we've got finish grade design on our curb outside the curb returns already. So our intelligence is there. When I built-- one of the things that I do when I was building my curb returns is I would always go 10 feet in each direction on the curb return, always set my 0 plus 0 at the PC depending on the direction that you were traveling. I found that that was a great way to do it to keep everything straight.

If you don't have a process to determine which way you're setting your PCs and PTs, somebody will stake a curb the wrong way and you will have a catch basin at the high point. And I can take you to one that I own. I don't really own it but it's definitely an embarrassing moment and it was purely an error based on the fact that I didn't document my process well enough and the designer that was working on the process-- or the designer that was working on the project after I left the project didn't make the same assumptions I made. Imagine that.

We all know that magic word. I'm going to add this guy here. No, we didn't. Profile, Surface Profile. That's not supposed to be there.

AUDIENCE: [INAUDIBLE]

SEAN HULBERT: No. I'm on the wrong-- the wrong place here. There. that ones not supposed to be there. Oh, but it's broken. It's not even there. Good. Excellent.

AUDIENCE: [INAUDIBLE]

SEAN HULBERT: What you'll see here is that I have made a wonderful choice on my style and where do I want the design. So now what this has given us is a starting and an ending point for our profile work. We can literally come back in here now-- I mean, I guess I'm not selling it as I should be-- but I think this is a great tool right here. [INAUDIBLE] tools. Sorry, everyone. Gosh. I do appreciate your patience.

I'm going to snap that right there because I know that's my PT. I know this is not a real curb return. Please forgive me. I'm going to snap it right there. This one is, say, Apollo Southeast. Come in here, I'm going to grab that alignment, and I'm going to grab the corridor if I can grab it. There I go again.

And Corridor Properties, we're going to go ahead and add us another baseline. We're going to add the baseline that's CR Southeast. I don't want you to have to watch me type a bunch of silly stuff that's not necessary. There it is. Now, in general, like I said, we want to make sure we name things correctly when we're doing this process for real.

And I've got me a curb return. I thought I had a curb return. Let's go find that guy. These are great tools here if you forget what you named it or if you named it improperly, like I have. But my curb return is pretty basic.

I don't like the fact that we can't target the flow line. I think that's another very important part that needs to be added to the tool, and so I build curb without a face. Or without a gutter, excuse me. And so here we go. Now, what have we got going on here? We used the wrong profile.

TOM: [INAUDIBLE]

SEAN HULBERT: Thank you very much. Tom is not listed as a co-presenter. He will be next year.

TOM: This is my audition.

SEAN HULBERT: We've got about 10 minutes left, guys, and this is not near as much as I wanted to show you but we did lose a lot of time at the beginning. We don't have a [INAUDIBLE] there, we just have a curb. This is where this tool works great. There we go. We got our curb return wrapped around. Oh, I got gutter on that. No, that's lane. My bad.

Now we're going to target again. Edit our targets, set region to target. Now we can take our lane and we'll start selecting things to target on that lane. We're going to select that feature line as one of our targets and we're going to come back and we're going to select the alignment as the other. So this is-- we're getting fairly complex now. And here we go. Now, we're going to add some additional frequencies in here.

AUDIENCE: [INAUDIBLE]

SEAN HULBERT: I'm not going to do [INAUDIBLE]. [LAUGHS] I wanted to. We're targeting everything. And you know what I'll do here is I'll just add this as--

AUDIENCE: This is how you would model [INAUDIBLE]. I mean, I'm generalizing [INAUDIBLE].

SEAN HULBERT: You know, I'd use the curb-- when we were talking earlier about a conditional assembly that I

helped build and it actually drops the curb face over a region, and that's what we used. So we would drop the-- you--

AUDIENCE: [INAUDIBLE]

SEAN HULBERT: That's another great way to do it. And a lot of times, that's probably the best way to do it. Again, if you're in an existing environment and you're matching, you really truly have to-- you have that constraint. So feature lines give you a lot of flexibility. The only problem with that is that you're manually manipulating that geometry, and feature lines can be a little finicky in the way they behave sometimes.

This is not anything near what I wanted to show everyone but I do want to give everybody a couple of minutes for questions. We've got about five or six minutes left. Do we have any questions? I'll keep going if you'd like. Yes, sir?

AUDIENCE: [INAUDIBLE] request offset to some of these? It does not utilize any of the [INAUDIBLE].

SEAN HULBERT: I haven't tried that.

AUDIENCE: That we would build our medians out of. [INAUDIBLE].

AUDIENCE: [INAUDIBLE].

SEAN HULBERT: The question was, offset assemblies do not use horizontal or vertical targets, apparent--

AUDIENCE: Horizontal conditional targets.

SEAN HULBERT: Horizontal conditional targets.

AUDIENCE: Yeah. [INAUDIBLE].

SEAN HULBERT: That's interesting. That's definitely something that needs-- I would actually view that as not a wish list item. I would view that as the other way. So reach out to me and I'll get that one taken care-- I'll get that one documented. I can't take care of it for you but I'll document it.

AUDIENCE: [INAUDIBLE]

SEAN HULBERT: Done. Any other questions? I can keep--

AUDIENCE: [INAUDIBLE]

SEAN HULBERT: Colorado? I think Phoenix is the same way. They use a lot of that. I worked in Phoenix for a little while. I would probably pull my-- how would I do that?

AUDIENCE: Right now [INAUDIBLE] stop everything and [INAUDIBLE].

SEAN HULBERT: Feature line it.

AUDIENCE: [INAUDIBLE]

SEAN HULBERT: So again, the question was, is how would you deal with a valley gutter that's cutting across this intersection allowing flow to flow all the way across? It's about what, six feet wide or so?

AUDIENCE: [INAUDIBLE]

SEAN HULBERT: Oh, OK. So they get rather large sometimes. And how would you deal with that in a typical intersection?

AUDIENCE: [INAUDIBLE]

SEAN HULBERT: To build the dip in the-- yeah. That would be a great way to do it.

AUDIENCE: And that's what we're doing now. It's just [INAUDIBLE].

TOM: The exact same way with a conditional horizontal target that if this exists, look for this first.

SEAN HULBERT: Exactly.

TOM: Either way you're going to put the lane. But you're going to look for something that I think--

SEAN HULBERT: You might control that off the main road.

TOM: --build your lane and then have it conditional that if this condition exists [INAUDIBLE] targeted this, then I [INAUDIBLE] lanes that build your valley gutter across [INAUDIBLE].

AUDIENCE: [INAUDIBLE] run into is making sure that you have [INAUDIBLE].

SEAN HULBERT: But that's a-- where I have the curb saying, if you don't find anything don't do anything, you could add the curb and sidewalk, you could actually add another condition to that that said, OK, if you find this then add-- and you could-- I mean we actually have valley gutter curb inside so you could drop that curb element in there. I don't know that I'd use a curb. I think I might use a shape.

The thing you want it to do is disappear as it gets up to that curb and that's going to be the challenge that you have. It's not going to fade out as you'd like it to.

AUDIENCE: [INAUDIBLE]

SEAN HULBERT: No. That's where you do add that additional information. Add some feature lines to your product. Add a couple of points. I mean--

TOM: Another option is--

SEAN HULBERT: --it's not criminal.

TOM: [INAUDIBLE]. And I think [INAUDIBLE] did that a few years ago at [INAUDIBLE]-- I don't know. It was a few years ago. But she did a separate [INAUDIBLE] of [INAUDIBLE] and she actually built kind of a generic curb, but she built it from a different direction so that we actually take the top of the curb and bring it down [INAUDIBLE]. So you could actually say that and transition it from a regular curb into a valley gutter and then pull it back up.

SEAN HULBERT: That would be a complex sub-assembly. Yes. Yes.

AUDIENCE: So in Phoenix we have a similar issue but we put-- you bring in your asphalt straight and it squares off and then you have concrete that fills in your return.

SEAN HULBERT: Yep.

AUDIENCE: So you have to create some of that sub-assembly that would have the curb, and then where it ends at that end of the return, then it would do the straight part through the middle while maintaining the flow line [INAUDIBLE].

SEAN HULBERT: The Phoenix ones actually, I think, a little bit easier to solve because you can just run your lane all the way up to the back of that, drop your curbs off-- and so you've got your asphalt-- and then when you're doing the targeting that we're doing right here-- sorry, I was going to point with my finger an be silly-- the targeting that we're doing right here, you would target-- because it squares off right here, right?

AUDIENCE: Right.

SEAN HULBERT: So you would target concrete right here instead of a lane. Just make your-- make that part of the curb return be concrete instead of a lane. It doesn't have to be asphalt. Is everybody fam--

does everybody see what we're talking about here? The question is is that--

AUDIENCE: [INAUDIBLE]. You get two lanes in your [INAUDIBLE].

SEAN HULBERT: You could do that as well. Yeah.

AUDIENCE: Then we also have the issue that our valley gutter is six feet wide and we only use one and a half foot gutter on our curb gutter.

SEAN HULBERT: It widens back into the side street, right?

AUDIENCE: No. It widens in both directions. In the main street.

SEAN HULBERT: Out into the travel lane?

AUDIENCE: Yeah.

SEAN HULBERT: Oh, wow. I didn't know that. OK. So we covered most of the things that I wanted to talk about here. We did talk about using the feature line as a corridor-- or as part of the corridor. I talked about adding everything into the corridor. One thing I really wanted to talk about that I didn't get to is that the challenge you'll have with this complex corridor is that now you're going to have the more difficult time building your surface.

What you can do is you can extract your daylight lines one at a time and apply those to your finished grade surface. But it'll be tricky because you're going to want to use an outer boundary and you can't. You can only use one outer boundary. So what you do is you create a boundary all the way outside of your entire project and you hide the entire surface, and then you go through each of those feature lines that you've-- or the extracted daylight lines that you have for each of your many corridors here and you apply those to your surface as show boundaries. And now you can see your surface and all the garbage in the middle is gone.

Now, in most cases, what we're going to have here is that there's going to be some sort of maybe lot grading going on or we're going to be building water quality facilities or something else so we're going to want to limit the extent of where our surface is going. But for the most part, taking those-- we can extract anything from that surface, or from that corridor, pretty much that we want. We'll take that daylight line-- I like to flatten it because I don't want to work with 3D line when I'm adding it to a surface as a high boundary or a show boundary-- but that'll give us that flexibility to limit the amount of information that's being displayed.

TOM: [INAUDIBLE]. You can then use a dynamic [INAUDIBLE] feature line [INAUDIBLE] another surface that you create [INAUDIBLE].

SEAN HULBERT: I hadn't thought about that. So what Tom said is that because we can data reference corridors now in 2017, you could extract a feature line from that corridor and then use it in your process. Where, in general, when you pull those corridors out-- the automatic corridors out-- or feature lines out of a corridor, they give you a little bit of attitude when you try to work with them. You don't have a lot of flexibility in what you can do.

Back on the question about flowing across the intersection, I've already got that feature line there. It's already going to know the elevation on both sides of the curb. So you're halfway there. You offset that feature line. It's not going to be a clean automated surface-- solution.

But engineering is an iterative process. We have to do something, it's not going to come out, right? We do it again, it's not going to come out right. I mean, how many of you designed a road the first time, submitted it, got it approved and built with no questions? No extras. Damn. I needed a partner.

So we're at that 4:30 magic mark. I'm so terribly sorry, everyone, that we had the difficulty that we had in the beginning. If you have any questions for me, please don't hesitate to reach out to me. I'd be more than happy to schedule a time to talk to you on the phone or anything to help. I appreciate your time and thanks for coming to AU.