PRESENTER: Oh that's a whole difference, isn't it? Good. Good to go? OK. So again, I'm looking at this project just to look at how we can plan the site, look at how vehicles can enter the site, potentially heavy goods vehicles, or cranes, mobile cranes, and that kind of things.

Obviously this is not during detailed planning, this is looking at concepts, and why has this customer chosen for InfraWorks, and why do I like this approach a lot. That's because we're working in a very visual kind of environment, which is very easily, very easy to communicate with all the stakeholders in the project.

The fact that it's so good looking, so nice, and fairly simple to use functionality, makes it a great communication tool. And even using it during the planning meetings, you have it all the people involved in that project.

So alternatively what would you use? Probably Navisworks, where you link planning to geometries that you have already created and one of the other tools that are available. And I think that just the biggest advantage in this workflow, as well, is that InfraWorks allows you to create geometry and the product itself, where Navisworks doesn't allow it.

So there are a couple of things I want to do. As I said, I want to use the sketching capabilities for some design. I want to look at temporary road design as well, want to link it with vehicle tracking, want to use the web viewer and the different communication tools that we have available to communicate what we're looking at.

So what I've done, I've been using the latest version of InfraWorks 360, which is 2017.2, I believe, and using every little bit of Revit and using a little bit of the other things. So basically we're looking about this little piece of the construction site. The 90 minutes I have is definitely not enough to go through the whole site setup, but we're looking at one specific location, that little closed area between the highways is what we will be planning in this session.

So the workflow, as I said, is we're we gonna use the proposals within InfraWorks to create different design stage proposals, gonna give them a name, create some access version. And this is just some visuals of the things that we will be doing in this session, use a little bit of the terrain tools to look at preliminary volumes that are required for certain areas, looking at the standard libraries with objects, looking at the integration with Revit and so on.

Second part is bring that information into vehicle tracking, do a swept path analysis for a mobile crane that needs to go on site. And then drape that result of that swept path onto my InfraWorks model, because I want to make sure that if I plan my site access road, that given heavy goods vehicle or a mobile crane really can access that road. So that I haven't done curves that is too small radiuses, and so on.

And so therefore I can drape my vehicle tracking result on top of my InfraWorks model, and eventually, or potentially make changes to my design road. Want to get volumes, because these are type of dirt roads, they probably need foundation as well because of very heavy lifting crane needs foundation on site. So we can kind of looking at do that very efficiently here.

And then I'm also looking at temporary road situations, like we have to put a column in here, which is kind of requiring opening up the existing road, the asphalt, so we have a temporary situation as well. So we need to have deviations on the existing road and to the model. So I'm using Component Road for it, because I like Component Road a lot, just because of the ability of using different components in that setup.

OK, so this is kind of the biggest portion of the class. And then we're going to look at the web viewer and the way of communicating all these designs. Makes sense? Nobody's leaving, so that's good. I'm very well impressed by the number of people that still are here, actually. I was kind of thinking a little bit less, but very good, thank you.

So again, as I mentioned, I have not done any videos as preparation, because I believe InfraWorks is so simple to use that it should be able to do at least bit and pieces live. So that flyover of that viaduct is something that one of the design departments in the company had done in Revit. Fairly simple, fairly straightforward, I wouldn't say that's a detailed design model yet. That's kind of a conceptual design model.

But one of the things I would say here is if you want to communicate these Revit models for infrastructure and geometry in a very efficient way in InfraWorks, then I would suggest that you use kind of shared coordinate systems.

You know, InfraWorks, all the data sits in a specific coordinate system. Revit typically sits at around 0,0,0, local coordinates. There are very easy ways to create shared coordinates. I don't want to focus too much on that, otherwise I'll probably need half a day, if I want to all these little bits and pieces. But we can set up shared coordinates in Revit, and that makes our life much, much easier because when you bring the models into InfraWorks, they drop in the

correct location immediately.

So I obviously have already done a couple of things. I'm not sure if everybody of you already has seen the latest version of InfraWorks. There are a couple of quite nice things in there. So this is kind of the model, which is based on civil trained data, based on aerial images we had available.

And with the new version of InfraWorks, with the latest one, we have also different views. And I like the engineering view because it's giving you some transparency that you can kind of look under the terrain, and you can have it, for instance in this case, have a view on all the underground utilities.

So one of the things we quite often say is the most dangerous things on the construction site are the ones you don't see. By having these engineering views, we can tend to have a better insight in this as well, just by setting some settings for transparency. So you can make as many different views as you want, setting some transparency, some lighting, and parameters, and all that kind as well. So by default, they come like conceptual and engineering, which is kind of sufficient for what I need.

So did these underground utilities, these are kind of coming from JAS systems that we have in place in our region, just as 2D shape files, we can very easily convert them into 3D models, if we have the depth and all that kind of information. So again, not talking too much about the way how I build this base model, but focusing on that conceptual side planning.

So what I would do is create multiple proposals, just create another proposal. And have already done it for the reason that I had imported my Revit model. The reason why I already did that Revit model import is simply because it takes a little while. I use the Cloud import, because I think that gives me the best quality. It maintains my materials and so on. And I've already imported it. And what you see in this case here is that this is not my full viaduct, but this is kind of just three piers and an abutment.

So what I did in Revit is kind of take that big model and split it up in multiple sub-models. So there's probably better or more efficient way, but for me it's very easy to handle the files, and manage the files, and know which Revit file belongs to which stage.

And then if I have kind of changes in what elements will be built in the different design stages, I can simply modify the Revit model, reload it, and have it in my InfraWorks environment. So I

ended up having in my class library here, for instance, four, five different Revit files, which are all subsets of the bigger design file. So that's kind of the easy, short way to work with that. And it's that specific Revit file that I have loaded in here, Flyover Stage 1.

So the nice thing about InfraWorks as well, if I have different proposals, all the imports I do in one proposal stay in that one proposal. So I can have another flyover file in a second proposal, and that will only be valid for that proposal. So this is kind of the very basic step, or the start of my little project.

Good, so let let's start at what other things that you require when you do site planning. Obviously there are a couple of other things you want to do. And I always start with barriers. And by default, the barriers are kind of basic. But in my opinion, it doesn't matter too much. The only thing I want to see, this is kind of my site area. And this is kind of the bounding area for that. And the only thing I do is, again, and it's basically too simple for words, but you're clicking lines and setting up, up, going down, maybe do this, this, this. And I'm kind of planning my entrance of my site here. So I'll probably need to do a little bit of this, little bit of this. And I can continue as much as I want.

Nice things here is these are all kind of standard elements with standard properties. If you want this fence to be 2 meters high, just change the elevation. And that's kind of what you have for it. Very simple, very easy, I can even dig this fence, right click, split the feature so I all of a sudden have two features, split it here again, maybe take this one, delete it, and I have an entrance now.

So it's very simple, again, two simple tools, but very nice and very quick of I want to do this in this situation, but maybe something else in an alternative situation.

AUDIENCE: Do you want questions during or after?

PRESENTER: We can do both, if that's--

AUDIENCE: [INAUDIBLE]

PRESENTER: The length of the fence, I can get quantities out of that, yes, but not in a very simple way, I think. I'll come back to that later when I talk more about quantities for Earthworks and that kind of stuff. So but you definitely can get the lengths out of that.

So this is part one, I would say. What else do you have on the site, probably an area where

you have the car coming and parking along, have kind of a building, kind of a site office, and so on. So we want to prepare and have that arranged in the site as well.

So what I'm using in the moment is just Coverages, which are kind of just shapes, or contour lines draped, or areas draped on my terrain. So we have already couple of styles available within InfraWorks. So I'm using the ones that are there. Obviously we can make styles as well. But as you all are aware, within InfraWorks is probably not necessary to mention all these details.

So I'll probably want to do something here. And just this gives me kind of my zoning of my site. And not sure if you've seen it, but while I was clicking, it was kind of showing what the area of that zone was, as well, so I could have a decent idea. So the reason why you see these kind of black crosses is because I'm in the Engineering View. If I go to the Conceptual View, you see different things as well.

Good, so by the way, you see the area here being stipulated as a property. So if I would go to that fence, there probably is properties here, as well. I don't see the-- Is there other properties I can do, Properties-- So I can't get it here. That's what I thought. For the fans, I would link it in Civil 3D and get the length in Civil 3D. But I'll show you how that works later on.

Then obviously I want to play some objects on that, clicking in my furniture library. I have a couple of vehicles in here, just click them and then rotate them, set them there, right. And one of the other nice things here is that I can just Control C, Control V, copy them in, have kind of many of these vehicles. I could actually even draw a line and put multiple vehicles along that line as well.

So if you want to put kind of the site office in here, you can use the buildings. I don't care too much what style to take at the moment. And we can start sketching.

One of the things you will see if you use InfraWorks for the first time, or quite new user to it, it's kind of like that my cursors are snapping to some points to other lines. One of the best tips I got earlier this year is if I use my Control button, and then click, I have much more control over and much more accuracy over where my cursor goes. So it's not snapping to point, I can just very quickly do this. Again, this is a little bit overdone, isn't it?

So I'll make it maybe three meters high. And maybe I want to change the style as well. And I want to make it just a simple color. So if my construction company, all the vans are yellow, I'll

change this construction and for the site office to yellow as well.

So obviously if you have kind of blocks, kind of 3D models of these standard containers with your logo on, just put them into the library of 3D models, in the City Furniture Library, and you can use them, very easily within the InfraWorks environment as well. So we have customers that have kind of 3D object for their vans, for their cranes, for their container, and all that kind of stuff. And then it's all kind of branded for your company as well, which is a nice advantage.

So there are a couple of construction vehicles and elements in there as well. So I probably want to have a tower crane somewhere. And I want to put it into the model. And again, this is all not rocket science. It's just using standard elements. If I don't want it to be that high, but 25 or something, I can change that and have it put in there.

Again, we're not doing detailed design here. We just kind of composing where I should put elements on the site, where not. Good, so that's the easy part. Probably want to do something about these construction pits I have to excavate for the foundation.

So we have something called Land Areas and InfraWorks, which is just kind of just a very simple element again. And at the moment, I don't see through my terrain. That's where my engineering view becomes handy, again. So if at least have an idea now of where I have to click, because I see through my terrain. Voila.

And at first sight, it looks like kind of a bit strange because I have not assigned what we call Grading Criteria. If you're a Civil user as well, you can do kind of grading criteria and assign that to it. So we have in the product itself, we have a series of these grading criteria available by clicking on this cube and going to the Style Palette. And then you go down. You have Grading here.

So and for the foundation, what I made is kind of a [INAUDIBLE] from the level of my bottom of my construction pit, I want to go up to the existing terrain with a fixed offset of one meter. I could do that slope for cut and fill different slopes, all this kind of stuff as well, but for the purpose of this, that's what I want. And the only thing I have to do, and this is kind of the cool stuff, is just drag and drop it over my model.

Still, it's a bit high. So I can make it lower. And then you will start seeing construction pits being created. Again, you can look through the terrain. You can have inside. You can fairly quickly, again, do this. It's a bit lower, OK. So now you want to excavate this hole and start putting the

piles in place.

One of the things you can do now as well is kind of look at what we call terrain statistics. Just select the area of your interest and get an idea of the cut and the fill that is required for that. So just very quickly sketching something, get some information that gives you at least an idea. If you want to do the detailing of all this stuff, I probably would go to Civil 3D, but it gives you an idea where all that information needs to come.

And we can do the exact same thing for the Earthwork body for this abutment as well. Instead of going underground we go above ground. So let me do that as well while we are using Land Areas, looking at this, clicking somewhere, up, up, up.

And I want to kind of have another style. By default, they're draped on the terrain, by the way. So now I can move it up and then start playing around with the position of these elements to make it a little bit more accurate. And again, I can do the terrain statistics to see what the actual Earthwork is.

And at this point, because this is quite accurate with the sense of the slopes, and have they a 2 to 1, 1 and 1/2 to 1, can see the position of this crane might be at risk, because my Earthworks body is isn't there. So this is kind of the purpose, very quickly be able to see this kind of stuff, OK.

And then you see if I have that crane, and turn it around a little bit. Will that be sufficient to reach to all the parts where I need to be? OK, this is kind of the idea behind all of that. So [INAUDIBLE] already a couple of things, zoning, putting elements on site, fencing around it, some Earthworks in there. So what I want to do now is create kind of the access road to the site.

I'm going to delete this model just for the sake of easiness in this presentation. So otherwise you will end up with having intersections. And we probably don't want to model full intersections for a dirt road going into the site. So having a good quality aerial image is probably as important as having detailed models of your roads.

So I have a couple of options here. I can and in InfraWorks we have three types of, right, which is the planning roads, the design roads, and then the component road. If you want to have some engineering intelligence attached to it, which is design rules, for instance, then you end up requiring to use design roads or component roads. The GIS roads will kind of round

automatically between the segments, but you won't be able to enter a radius.

So I'm going for the design roads, which is the preferred one. I'll talk about component roads later on. So this is probably not a high speed road so I can start off with design rules for local roads, right. And then I've created a style, which is just a simple dirt road, or sand road, a rock road, whatever you going to call it, with a given width. That's all it is, pretty simple.

And then we start doing the road. OK, this is what we want from here. And one of the things, and this is pretty important, I think, is when you design roads, they're always speed assigned to it, because the speeds define what minimum curve radii, and all that kind of stuff is. So when I take a local road within InfraWorks the default speed is 45 kilometers an hour.

Probably don't want 45 in here, I'll go to 20. And if I then continue with my design, you will see that I will be able to start sketching in the environment. And it will allow me to have curves. If I have, for instance, a speed of 65 assigned, then the curves will be very big. And you will end up having two straight vertices and comments saying that the software cannot make or fit a curve between these two straights.

So that's one of the things are forgot most in the beginning, when I was playing around with this, setting the design speed low enough so I can at least have a result. OK, let me do this and then this is kind of the proposed road.

Obviously at any point in time, I can change the value. So not for all the countries, we have design rules as well and potentially for site access, it's not that important. You have to start with this design rule. But I can modify all these values. And while I was doing it, it already did a vertical design for me as well.

So this is kind of giving an indication this is what I want to do. This is how it will look like on site. And then just to make it a little bit more fun. What did I want to do? Again, City Furniture, I'm going to take the concrete truck and put it in here. And I know it's kind of very simple playing around, but it's very good indication of sizes and all that stuff, OK.

So again, very simple, you can do that even in a meeting when you're sitting with a lot of people together, and dragging all the stuff around, discuss about this. OK, that's the first step, doing the little site setup.

What I want to do next is check if I have kind of a heavy lifting crane special vehicle, can that use that access road? Will the curves on the top there not be too small? So what will happen?

Because I need to know that for the foundation of my heavy vehicle coming on site. It's not just sand. It's kind of foundation required on that access road as well.

Therefore I will use Vehicle Tracking. Vehicle Tracking is an add-on on AutoCAD. I will use Civil 3D because Civil 3D allows you to read your InfraWorks model, or the information from your InfraWorks model. The only thing that you need to be aware of is that at the moment that I want to bring in my InfraWorks model into my Civil 3D environment, I need to close InfraWorks, or open another model. Just going to my home page is not enough because my last model will always remain active.

So what I won't do for the sake of this is just close, close InfraWorks. And on the insert site, in Civil 3D, I have opened Civil 3D with a standard template which sits in one of the country gates. I have the option to import InfraWorks, or open InfraWorks models.

The only thing I have to do is find where that model is. And this is another one. So I have to do, oh I'll take this one. There's something in there, doesn't matter too much. What you will see is that you will get the coordinates system of your InfraWorks environment, which is [INAUDIBLE] in the Netherlands, because the project sits in the Netherlands.

I have a coordinates system and my Civil drawing. In the templates you assign coordinates to your Civil drawing as well. So there's a mismatch in this one, because I have a British template-- Dutch coordinate system for the project. So I need to set my coordinates system and use my coordinates system in Civil 3D as well. Luckily we have the option to do that, just clicking a couple of options.

So what is the second step, and this is probably an important step with regards to the time we will wait for the data to come in, is I don't want to have that whole kind of model in Civil 3D, right? I just want to have that little area of my interest, rather than anything else. So I want to select that area.

And that's one of the nice things about Civil 3D as well is that you have the capabilities to have Bing images into InfraWorks as well. And as my drawing is georeferenced, I have that kind of same aerial image, just coming from Bing maps in my model. And you see this is kind of the design flyover already, so this is a really built project.

And my project sits in this little area. So that that's kind of the area of my interest, make it a little bit bigger. And this can take up a little bit of time because the software is now going

through the InfraWorks database, seeking what all the objects are. And the information you can get out of InfraWorks is quite a lot, actually.

So just to give you an idea, we have Surfaces coming in. We have Utilities coming in, the pipe networks, I probably don't want these, in this case. We have Planning Roads, which are the GIS roads, Design Roads, Intersection, Drainage Networks, Coverages, that's probably an interesting one, Water Areas, Bridges, and Roundabouts.

So all this information can be brought into Civil 3D. I only need a couple of them. And there's a reason I had that kind of zoning plan for where my vehicles were parked, and where my site office would be. And I will bring that in as a poly line as well. And there's a good reason for it. And I'll explain that later.

One of the things that might save you a lot of time, as well, is to set what the style will be of that incoming object in Civil 3D, so you can make it look right from the beginning. So I want to have my surface being one to five meter contours, [INAUDIBLE], my alignments, for instance, I want to have this alignment style. I want, or do not want to have labels.

So I can all set that pretty simple, so no labels, just checking design style. So if you have Design Roads as well, and I didn't mention it too much, but we're doing both horizontal and vertical design of that road. It's all done in one single go. So it's pretty simple. OK, change, save it, yes. And then I can even refine the selection so that I don't need all the terrains, for instance. I'm only interested in the existing ground not the other surfaces. Maybe you want to use other roads.

One of the things I could have done is give my road a name. Then it would be much more obvious what road I'm talking about, because number 14 is kind of a Chinese restaurant menu, right? I need number 14. I have no clue what that actually is. So again, this is all the things we might have. OKey dokey, and opened the model. Well, that was quick. I'm actually impressed. Normally it goes a little bit slow.

And what you get, and this is the main thing, you get that alignment. And this is from another model. So I'm not using the exact same model. But this is what you get. And you get an alignment. You get terrain models and all the things you want.

So talking about this, what I can do next is use Vehicle Tracking. I'm not sure if all of you are aware of what Vehicle Tracking is, but Vehicle Tracking is a swept path analysis tool, has

multiple components, but one of the most important, in this situation at least, is that we have a full library of vehicles. And these vehicles are kind of designed, standard design vehicles.

So for instance in Belgium, we have for special transport, kind of standardized vehicles that we might need to use. We also have, as part of your subscription advantage, have real wide vehicles available, like these Liebherr cranes, mobile cranes for instance.

So I want to test that crane can get on site. This one, construction vehicles, the big one, I want the biggest one. Let me check, the 90 meter will do. Double click on the vehicle, and then we can put it in the drawing, really. So again, that's where the aerial image becomes an important or interesting. I can put it on the road, then turn my vehicle around, OK, not completely, happy with what it is. And then I can still move it around, right.

So that's pretty simple to use. And then I can see well, what kind of curve that vehicle can take. And I'm a bit dodgy at the moment. It's a long week, so little bit less smooth than I hope to be. But this is kind of what you can do, right. So here we can see, OK, it's only the alignment, but at least you can see if it's kind of close to the alignment. So you kind of moving away pretty far here, and you see I can't do much because if I drag and drop this, my part will be broken. So this is kind of a movement the vehicle can't make, pretty simple.

So this gives me some idea what the type of turns are that that vehicle can take, and that at least I haven't done a really bad job in choosing the radii for my curves. Important that we know that, again, for the purpose of the foundation of these temporary roads, right. We want to be as optimal as possible.

So I have done this and probably want to save the drawing somewhere. And then that's kind of where the Civil part sits. Obviously I want to bring that information into my InfraWorks environment. So start InfraWorks again. Go to my model, open it up. Here we are.

So basically if you look at the data sources, you have multiple ways to bring in DWG files. And one of the ways you can bring in DWG is as an AutoCAD 2D Overlay. And this is what I want to do. I want to just take kind of the overlay, or drape that image, or Civil 3D DWG format with that swept path on top of my model.

So because I was like actually messing around with multiple models, I will show you just the result. That's when you do live stuff, something can go wrong. But then you have a backup. So basically, this is what I have. So I have in the project, I have my design road. And you see I

have kind of my swept path being draped on top of that.

So the only thing you need to be very well aware of is that when you do this, this will come in kind of very small. That whole DWG file will be kind of a stamp on top of that model. So it's not using the georeferencing from the DWG to place it in the correct location automatically. And then you have to place it by reference point. And the reference point is basically saying, I'm clicking a point in my DWG file, clicking a destination point in my InfraWorks model, and do that for three different points. a technique we call rubber sheeting.

And that's basically also why I had that outline of my zone here, both in my DWG file as well as in my InfraWorks model, because these are easy points to click, right. If you have to pick the start of an alignment, it's a little bit more difficult. So I wanted to have a very straightforward object, where I can georeference it to, otherwise it's not accurate at all. And this makes it accurate.

So and then you see, OK, for this example, I did a really good job. That was probably in the beginning of the week. And my role that I have designed is capable of having that truck. I probably can optimize it on this side because it's quite wide now, I could make it a little bit smaller so I need less foundation and stabilization material. But this is kind of a nice way of using multiple tools that you have available and start planning a little bit, these access roads. OK, does it makes sense?

So one of the things I want to do next is just jump a little bit here. So there was a sir asking about length and quantities. So if you want to have quantities of this road, I could do bits and pieces, if I use these design roads. But probably just using the same terrain statistics, which I added earlier with these Earthwork volumes.

So what I can do is convert that design road to component roads. And I could have done a component road from the start, but I just wanted to do different things, just to keep myself busy, really. So when I convert it to a component road, it will kind of have more detailed information on the thickness of the lane and all that kind of stuff.

And when I do that, and when I make the conversion, then all of a sudden I have a couple of other things which are allowed, and or which are available now. And that's doing volumes as well. One of the volumes, and that's quite interesting, is cross-section based. So the ones that know Civil 3D well, you have that in Civil 3D as well, the option to do cross-section based volumes. It's kind of the same thing that's happening here.

And via the settings you can say, well, the increment of that cross-section will be for the calculation. And I can put that as kind of a dialogue. I can see it in this little piece here. This is kind of the cut fill, the net volume. But I can as well, and that's quite interesting, export it to a CSV file and get in Excel. So it's giving you a little bit more detail. And that's kind of the trend that you probably have heard as well, that we do in a lot of these things in InfraWorks.

And this is a kind of a nice segue in what I want to do next, which is I need to build a pier here. So there's some Earthworks involved. I probably need cranes as well. So I need to set my temporary road situation. I need to do something there as well. So not that I want to delete this whole road in reality, but in this model I probably don't require them to still exist. And again, this is where you start playing with having multiple of these proposals, where you can easily switch to. So I've done just one proposal for stage 1A, 1B, 1C, but you can eventually end up with 20 proposals for stage one. And then just pick the one that you need.

So what I want to do here is look at how can I divert, deviate the traffic driving on here, bring it here, so I have some room to work. And I want to do that with component road, because I like component roads a lot. So it's just another type of roads that you see in this one.

And a component road is kind of a road with sub-assemblies in Civil 3D. So I'm a Civil 3D fan, big fan of Civil 3D. It's the most amazing product we've ever done, much better than Revit, and Inventor, and all that stuff. And we have a couple of standard combinations, like two lane road, which is just two lanes [INAUDIBLE] the thickness and a certain width.

OK, so I'll start with doing that road, really, I'll do that. And I'll start playing around. Let me do this, click, click. And I have to cross to the other side, click, click, right. What we typically see is that we don't do it this way. And again, what did I do wrong? And I mentioned that I always do it wrong.

AUDIENCE: Design speed.

PRESENTER: Design speed. So you want to click too quick in InfraWorks. It's too much fun to click. So this is not intended to drive along at 110 kilometers an hour, all smile, the cameraman is there. I'll do kind of a collect road with the speed of 50. So typically, very rarely, we will end up having speeds like 50. So that what I set. You end up with having straights with no curves because of the speed of 110, and the situation being not good.

So if I change the speed to 50 again, I might be lucky that that radius fits in. So, and then I can make it a bit smaller because I probably want to make it smaller. Or I see that I have to stretch it out much more. So because of these design rules and that minimum radius kind of ID, you see if the thing that you're planning will work, yes or no, very quickly. OK, that probably won't work because there's kind of this very nice lamp. Let me make it look a bit cleaner.

So that's probably not going to work. That's probably not something you want to remove for a temporary situation. So now you can start playing around with the position of all these type of elements. So that's kind of where it all sits. And I'm probably not going to solve it today.

But what typically happens as well is that we don't move it into two lanes. We want to go from two lanes to one lane, go to the left, and then drive all the way here because we want to change from two lanes to one lane, and have merging capabilities there as well. So that's, again, that's the main reason why I chose to do component roads in here because I can very quickly click on one of the lanes, say that I want to split that component probably somewhere here, and I want to get rid of this part.

OK so we start with a very simple, very basic configuration. I can say that I want to have a transition out here as well because you probably don't stop that quick. And you can set the length, for instance, for that transition length. So in just a couple of clicks, I've gone from a two lane road to kind of one diverging into one, going all the other way.

Typically, you would have yellow paint as well. Well, that's at least what we do, temporary paint on the road, this yellow. So what I can do is I'll probably add a component, so I can insert a road component at any point. That could be any of the components in there.

So I haven't found a way myself to create new components as kind of geometry myself. It's possible. I've been told it is possible, but it's a bit difficult. There's no UI for it. Like it's no supersembly composer to do it. so probably just faking little bits.

So I'm adding a lane here. And what you see is that my cursor is kind of jumping to all the places where I can insert kind of a new component. So I want it to be on the right, start at the beginning, and bang. That's what it is. But I don't want it to be a lane. So what you see here as well, on the right, so it is the properties that you have available, was the rate of lane, that's over Lane Marking, 20 centimeters, 15 centimeters, depending on the country you live in.

So 0.2, keeping the same slope, voila. And I don't want it to be black, but I want it to-- I have

something with the color yellow today, I noticed. So this is yellow. And I don't want to have the transition out. And I want to have it all going all the way to the end. That's how simple it is. And you can build your own configuration the way you want. And is it perfect? Probably not, but it's good enough.

So once you did a little bit of work on kind of doing this, there's quite a nice thing that you can add this road combination, or this component configuration to your library, and have kind of a custom library of assemblies, again, to talk Civil language.

And then you just say, OK, I want the combination from this location, because we have these multiple components alongside the alignment. I want this location. And I'll give it a name custom, so [INAUDIBLE], for instance. OK, and then I have to click the plus. And then it's in my library. And I can use it for all the rest of things I do.

And then if I do another component road, so I already did a couple of these temporary road configurations while I was preparing, but then very quickly. And again, you see that with the alignments as well, they're jumping to each other, kind of object snapping. Just hold the Control key and you can do whatever you want with it. And then I release my Control key. And then you end up doing this, so Control again, and this.

And now you can do the exact same process. This is very straightforward, very simple. Obviously you need some decorations to be put in here as well. And again, I'm doing the same thing over and over again. That's how simple InfraWorks is. I can do City Furniture.

I have a lot of construction things. I think it's a sign. You have signs in there. And one is a Warning sign, for instance. And what I want to do here is take it, but not place one single and do Control C, Control V. I just want to place a line along this and here. And what happens if you press escape now, then you kind of get a slider, where you can move the number of elements you place along. And then these are now positioned a little bit wrong. So I can do this.

So again, when you click once, you get the single object. When you click a second time on the object, you get to the whole group. If I go into the properties, I could probably play around with the rotation as well. And I have to update automatically. And then you can see what angle that is kind of required to make them look a little better.

Again, it's not the purpose to be completely detailed. It's just to very quickly be able to set

these type of things and talk about it. Do that during a meeting, have a discussion, does it is right, does it look wrong, that type of thing. OK, So very easy things of doing these things. And again, these component roads are kind of very, very, very helpful, and being able to really easily modify and configure that road layout.

And again, as it is kind of a road, we can do the volumes. If you want to have the length of these road markings, I would probably go, again, to Civil 3D for that detail. So this is this. I want to talk a little bit about how, OK, we have done all this now. It all looks great. This is all big fun. How can we communicate? Because that's kind of the purpose, right? We want to have a clear communication on how we want to set up the construction site, how we want to move the traffic around in temporary situations.

And one of the things I like a lot is providing drive-throughs, because that gives the people an experience, or a view on how they would experience that road, or that temporary situation looks like. So in InfraWorks we have something which is called Storyboards. And already did one, so I'll do a new one, Add a New Storyboard. And I can simply pick my road and create automatically drive-through that alignment.

And that's something that is there for a while already, but what we've done the latest kind of releases is improve the parameters that you can set, because you're not driving on the alignment itself. You're not driving in the middle, but you're driving somewhere. Or as a driver in your car, you're kind an offset away from the alignment, at a certain elevation away from the alignment.

So that means horizontal offset, minus 1.5, typically the vertical offset is 1.1. I can set the speed of 50, so you really experience that at the real speed, so the camera is animated at the real speed, have something with keyframe density, is the more you have, the more quality your video is. And then you can very simply drive-through.

And this is, again, very easy and very simple if you do this in the model. But when we're talking about communicating, oh, that's probably not good. So we have to change, and all that kind of stuff.

So what I want to do is I want to make that information, and that drive-through experience, and so on, available to people not sitting in my office, but let them experience the same throughout the web viewer that we have in InfraWorks.

So one of the things you can do is export--

AUDIENCE: [INAUDIBLE] path by the object [INAUDIBLE].

PRESENTER: Yes.

AUDIENCE: So you can select that component [INAUDIBLE].

PRESENTER: Yep, so with this camera you can do a lot of manual placing and moving of the camera, but I have the option here to create from a design road or a component road. And then it's kind of just driving along the alignment, really, at the given speed with a given offset, OK?

AUDIENCE: Are you able to set x amount of cars around the road, create and then show [INAUDIBLE]?

PRESENTER: So good question, so the question, I have to repeat the question for the recording. So can we automatically place an amount of vehicles along the road and see how they would merge together in that one lane? Yes, that's one thing that's possible. I'll touch on that later on the session that we have something which is called Traffic Simulation.

So it's not purely visualization, it's really analysis, where, I don't know if you know Civil View, but Civil View is on 3ds Max allows [INAUDIBLE] alignment to place 20 cars on that alignment, driving with a given speed. And that will be very static, only these 20 cars going around.

What we do here is with traffic simulation is giving you the capability, based on number of vehicles going from one location to another, and analyze how long the queues would be, and then visualize that was all in here as well. I have in my slide deck an example video of another situation where we've done that. So I'll show that in a bit as well, because that's probably one of the nice things that you can optimize the temporary situation for minimal delay, for minimal problems. That's kind of the big business case we want to talk about.

So what I want to do this, because this is just a very simple example, is I want to share that, again, via the web browser, because you might have public hearings, public consultations, you want to have a project website, maybe where we want to inform the public about what's going on. And the better you communicate, the happier people get. If I don't know what's happening, I will not be happy. And I will be against it. That's kind of the idea.

So for that, I want to make the video available. So I can create an export from it, could be an MPEG or a WMV file, and generate a specific resolution, and so on. no other software

required, even if you want to have captions, like titles on top of the video, you could do that here as well, over that InfraWorks environment. But that's a little bit too far for this afternoon.

So I've already done that. And what I basically did afterwards, I put, uploaded that video on my YouTube channel. And I ask the question myself, Bob, this is sometimes a video that I want to share with only a select group of people, and not with the wide public. Well, I always do when I publish videos, kind of for use within the web viewer of InfraWorks, I set them to Hidden. And this is just Hidden in Dutch.

So if a video on your YouTube channel is hidden, you really need to have the URL of the video itself before you can access it so not everybody can search on it, not everybody can access it on your YouTube channel. So that that's kind of a level of security that we have added. And I will use that later on to put it in a Tooltip for my web viewer. OK, so this is kind of the process.

So I want to go back to my slides a little bit, because there are a couple of things I want to say about that communication. I'm already talking for 57 minutes. So one of the things I want to do is create bookmarks, which are kind of named views, if you use Navisworks, or kind of viewpoints, kind of positions where you are. And what the software will do is when you publish it on the web, it will create a 360 degree rendered image for that viewpoint.

So for specific locations, you can then get much more detail. It's static rendering with quite good quality. This is how stage one would look. So that's, I'll show you how that works as well. That's what I mentioned, creating videos on YouTube.

What I want to do, and which I will show later on as well is that, for instance, for that Revit model, and my web viewer, just kind of a static thing, if you want people to be able to view that detailed model, you could upload it, for instance, to BIM 360 Team Model [? ARCH ?] Model Viewer, and have a link embedded in your web viewer to that model as well. So I have done that as well.

So what I've done and this PowerPoint, I have provided all the URLs that you need, and everything that's a little bit difficult is all documented in the PowerPoint guide. This is the embed code I need to copy and paste in InfraWorks to make that YouTube video work. I need to have an iframe rate, specific height, and then the link to my video.

If you just copy and paste and replace that code, BKJ, all that stuff with your own video, then it works for you as well. So I'll show how that works as well. So I have the large model view links

in there, to the flyover both, maybe as well to the Vehicle Tracking DWG file.

And what I can do as well, but probably not for the whole model, I can take for a specific area of interest, I can create kind of an interactive viewing experience. This is kind of the very old web viewer we had. And people will be able to interactively walk through that model and navigate through it. That's a bit cold in here, actually.

And this is how it looks like in the web view, but I'll talk about that. I'll show a couple of things live in here. So one of the things I could do, for instance, is the Bookmarks. That was the first thing. So there's a little button here, which is Bookmarks. And basically what I want to do is if I want a position here and generate a 360 degree of a rendered image, Bookmarks, Add Bookmark, [INAUDIBLE] one, for instance.

And then there's a little button here, which is kind of an eye with two arrows around it. If that's turned on, being orange, then it will be rendered out. If you don't want it to be rendered out, you just turn it off. So you can, from all the bookmarks you have in your model, you can choose which ones are rendered out and which ones are not. OK, and you can make as many bookmarks as you want.

That's one thing, if you want to kind of have these hyperlinks to that video, for instance, what you would need to do is create a, what we call Point of Interest. It's kind of just a symbol that you put in here. And you place it in the model, let's say here. And then in that Tooltip, or in that Tooltip page, there you shoot copy, kind of this text, page the mouse on it, paste it in here. OK, and it will be available, OK.

So it can take a while before you see it appearing into the model. I've seen that before that it sometimes takes a while. What sometimes helps as well is in the Property here is kind of Proximity Distance. That means that the bigger that value is, the quicker that Tooltip will show up, OK, pretty straightforward, pretty easy.

And again, I have a link button here as well. So I can put a Tooltip and there, add a link to my, for instance, Revit model. So I've already done that, obviously in my previous, or in my preparation of this class, where I have, for instance, this here, a link to my Vehicle Tracking file. This is the Tooltip with the video, and so on.

And then you need to have that web viewer available. You need to sync the model to the Cloud. So there is kind of this syncing button here. It's on the top, which puts that model on

your Cloud storage, because everything I've done so far is just on my desktop. So if you want to share it on the Cloud, you need to sync it.

And then the button next to it brings you actually to the website. And sometimes you need to login into that to make it work. All right, and basically what you have to do here is, for your model, you will see all kind of the proposals that you have available. You have to choose which proposal you want to run the route.

Do you want this panorama with the 360 degree renderings? Do you want them in high quality or standard quality? The difference between the two is that you can zoom in or out in the high quality, and you can't do that in the lower quality.

Do you want to be it publicly available? That means that you still need you the URL to access it, but you don't need an Autodesk account to login. If you disable the public sharing, then everybody will need his Autodesk account. And you will need to assign them in the group that they can have access to it. So you can make it really kind of protected as well, that only the people that you trust, that you want to see it, can see it. If it's more public, you can do whatever you want, but you have to enable it.

And then you have to click the Start Render button. And this can take awhile. The first render I did took five minutes, because it was quiet on the internet. The second one I did took me three hours, basically. So it can take a little bit of time before the render is final. And you will get an email saying that your web viewing experience is ready for use.

So I've done that Stage 1c rendering, or web viewing experience. And the quite cool thing about this is this works on your iPhone or your mobile phone, smartphone, as well. There is no installation of web viewer technology required. It's full HTML 5. So I looked at the rendering on my iPhone yesterday during one of the sessions to see if it all worked out.

And what you see is you got kind of a top level view of your model, as kind of a pan over view. And you see all these different symbols. And these different symbols are kind of the different things. And if you see a purple kind of thing with a number, that means that there are kind of a lot of these pings close to each other. And then you need to have this kind of thing available.

So these red ones with these IDs are these 360 degree rendered kind of images. So this gives quite a good view on how that site looks like. Well, this is my interactive scenario. So if I take that, it will open up another kind of view. And this is much more interactive. See? So it's a

subset of your model. So that it will take a little while to load, but then people can interactively move into that. And I just saw that in the rendering. In the second rendering, I lost my Tooltip with my YouTube video. But I'll fix that.

So this is kind of what you end up with. But it gives you a very good way of communicating all these design intents stuff to the people that are in need of that information. So this is kind of a quick browse through. So I have kind of a little extra that I want to mention. This was kind of the setup of the session with a couple of items that might be interesting as well. And one of the things that's of interest, I think, is that that web viewer can be completely embedded in your own website.

So I've just done a very simple HTML file, which sits on my computer. I can embed that web viewer in my web page. So let's say that you have a project running on, or going on, and you have a project web site where you want to put that information. And you can very simply embed that web viewer in there as well. I like that quite a lot, actually. So very updated information, because you just have to re-render. If you don't, then your website is updated once you have embedded it into that website. So very simple to do, the sample code is entered to the documentation or into the slide deck as well.

So that was the one thing. And I put Traffic Simulation as a bonus section, because I wasn't sure if there was somebody asking for the question. But as you did, I definitely want to mention it. So again, InfraWorks comes with Traffic Simulation Engine, which is a proper traffic simulation engine, which can get quite complicated if you're not a traffic engineer. But you can do quite a lot of parameter setting.

So the example I did was more an urban situation, where I was closing a lane. And you can set priorities on the intersections. You can set number of vehicles going from one location to another location. You can set this is a priority, on the intersections. Is that a [INAUDIBLE] situation? That lane has priority over another lane, that kind of thing. If you have an intersection, which is managed by traffic lights, you can even play around with timings of traffic lights. You can play around with, I close a lane in this configuration.

So it's all there. It's a separate kind of tool which reads the InfraWorks model, reads the geometry from the InfraWorks model, and allows you to set all these parameters. And that is the way it looks like. It's a little bit more technical. That's how you set all the color coding for block lanes.

And then you see even with these arrows here, for instance, these are all the directions traffic can flow on that intersection. And you can configure it from there to there. And you can all modify that. But I think it's two sessions on its own to talk about all the details. I just want to mention that it's definitely possible. And that's definitely one of the appliances.

And then if you have done a traffic simulation, you can visualize it in InfraWorks in different ways. It's a cloud service. That's something that needs to be said, because all the calculation of the traffic movements is done in the cloud. And you get the result back in InfraWorks and Visualize. And you can show that this is kind of these bars. And everything that's blue, people are kind of happy. Everything that's red, people are starting to use the horn because they're not happy at all. You know what happens, right, if you're stuck in traffic?

So you can do multiple analysis. And basically in this situation, that was for a customer, again. So I was going from two lanes to one lane in that direction, and the crossing up to the right. And the green arrow was kind of the priority. They were going first. That's kind of the situation. We had a lot of delays in all the connecting roads because of that priority situation.

Then I started playing with parameters around, and change the priority that the vehicles that come from the top there, going to that road here, if you change the priority for them, that they're going to go first and the rest has to wait, then all of a sudden you see that your situation is much better, no red, no horns, everybody happy type of situation, in an ideal world.

But if you can start using this to propose alternative solutions, or validate your proposal of temporary situation traffic-wise, and can offer the optimal solution to your customer, your customer will be much more happy, and yourself as well. And again, you can animate that. So you just kind of multiply by 10 speed-wise, otherwise it's boring to watch this video for three hours. So you can speed up the play, of the replay of that video. But that's kind of a video that you can generate, showing how traffic flows on your project as well.

So traditionally people use that for new designs, but definitely for temporary situation. I see much more value, rather, than for the new design situation. OK, so the tools are there. I think there's quite a lot of information available, YouTube videos and documentation on the InfraWorks web site. And otherwise there are people like me in your region that can help you with that as well, OK.

And the last thing I wanted to mention, because I had cranes in my model. And I was kind of pretty impressed with it. And it's nothing to do with InfraWorks at all, but it's one of my

colleagues did a session earlier this week at AU about Crane Positioning and Optimization, so to analyze it to visualize crane sits there, can it reach all the parts of your model, in a more algorithmic way than my just visual way. I just want to point out that that class is there as well. All the materials are available. And just because I had cranes in my model, basically.

OK, that's was it, actually. So this is kind of the content I wanted to talk about. Not sure if there's any other questions that came up during the session. So you can ask them obviously. If not, I will give you 18 minutes more drinking time.

AUDIENCE: [LAUGHTER]

PRESENTER: So thank you very much for coming, and have a good.

AUDIENCE: [APPLAUSE]