

## Transcript

Title: Webinar - Geodesign for Project Planning

Presenters: Prof Hussein Dia, Devin Lavigne

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HUSSEIN DIA: Hello everyone and welcome to today's webinar, which is part of the Smart Cities Research Institute monthly seminar series.

Today, it is also our pleasure to be hosting this as the first webinar of the Trimble Visiting Professionals Program, which is a new collaboration between Swinburne and Trimble in the US, we look forward to hosting more of these events on a regular basis going forward.

Before I introduce our speaker today, I would like to start by acknowledging the Wurundjeri people of the Kulin nation who are the traditional owners of the land on which Swinburne's Australian campuses are located in Melbourne's East and outer east.

On behalf of those present, I pay my respect to their elders past, present and emerging, I also pay my respect to all aboriginal and Torres strait islander people of Australia and hope that the path towards reconciliation continues to be shared and embraced.

I would like to introduce our guest speaker Devin Lavigne. Devin is a city planner and urban designer with special expertise in 3D and GIS applications for land use planning and development visualization. He is a principal and co-founder of Houseal Lavigne, a US firm based in Chicago specializing in all aspects of community planning, urban design and economic development. Devin's work and innovations have attracted national attention in the US receiving multiple awards including a planning excellence award from the American planning association.

Devin's talk today is on GEOdesign and how digital innovations in this space can inform planning and enhance public engagement. At the end of the talk we will have an opportunity for a Q&A and some discussions. Welcome Devin, we look forward to your presentation.

DEVIN LAVIGNE: Great, thank you so much.

All right, I will share my screen and jump right into it, thank you for the introduction, thank you to the Smart Cities Research Institute for this opportunity, and Trimble of course for the Visiting Professionals Program.

It's always great to get these opportunities to help share knowledge and show how we are innovating and continuing to sort of push the envelope and in our field of planning.

So again, my name is Devin Lavigne, I am really, at this point a 3D expert, it didn't start that way I started as a city planner, I have two brothers they're both architects one is in Sydney Australia.

And really my whole life I sort of aspire to get to a quality of visuals that they were able to produce as architects and it's interesting now they call me to kind of help them through different things.

And then, as Hussein mentioned our firm, we're in the US we're starting to do international work but you'll see throughout this talk here that we pride ourselves in being innovative and trying new things, and we like to have fun while we're doing it, so you know, we work a regular working week but it doesn't feel like that, it feels like we're always sort of having fun, while we work and have the pleasure of having some clients that sort of unbridle us and allow us to try different approaches.

One of the things we've been known for and I heard someone refer to this as, 'planning porn,' the sort of graphics that the planners love. 3D has really been a staple of our firm since we started using SketchUP in 2004, and along the way we have always integrated 3D over the 16 years of our firm all of these done here with SketchUP using rendering plugins and photoshop and illustrator, and knowing that people look to communicate in 3D has always been something that's been important to us, a way to integrate 3D graphics to convey planning concepts and simple illustration like this just, you know nothing there's nothing too ground-breaking in any of these, but they do add a lot of interest into a planning document.

This one, the redevelopment of a town Centre outside of the City outside of Cleveland, done in SketchUP and rendered with a rendering plugin just to help these communities envision the possibility.

And what this sort of 3D journey led us to was something we call the Geodesign toolbox, we started to realize that it wasn't just SketchUP, it wasn't just illustrator, it wasn't just GIS.

We created what we said is our Geodesign toolbox.

And we don't stay in any one software for too long, and what we have found is it's sort of a workflow and that's what Geodesign means to us, we know there's a Geodesign framework that's put out there by academics and it's an entire process, but in our company, we think of Geodesign as GEO enabled tools, tools that are smarter that can help us make smarter plans.

Sort of our firm model now is planning beyond the pretty picture, and so, while we know we put out these pretty graphics, with today's technology we know that there's science behind the approach, as well as data behind the work product. So, I want to highlight a couple of things here, I've got a few projects to highlight that I'll kind of walk through how we approach a project, and if you're like me whenever I pick up a you know if I see a graphic that's in a plan, or a rendering I'm always sort of curious how it was done, and kind of wondering how the designer or the architect or the planner did the illustration, and so what I'm going to do is sort of peel back the curtains and sort of give you a look at how we approach a project. So this was a rundown warehouse, the City approached us and said, hey we have this white elephant, no one knows what to do with this warehouse, can you help us come up with some concept plans for it? So, if you were paying attention on that geo design wheel, we still use pen and paper! We take our trace we start to sketch concepts, we believe

your hand can move faster with a pen than it can on a mouse, so we sketch out concepts, iteration after iteration.

And only after we're happy with those concepts we start to refine them into programs, so these two land use programs, how we're going to keep this existing building and intensify around it. We'll bring it in, in this case we bring it to SketchUP and we mass out, so from a massing standpoint, what are we talking about, these plans, and how are we going to intensify that site?

And this is some of our early work with Ezra CityEngine, so we create these rules where we can drag them onto shapes and this rule we call it a detail building generator and it develops 3D for us on the fly. So, the rules tell us how tall to extrude the building, which style of windows to put in, the balconies. It's developing 3D geometry through a procedural set of rules and all the parameters on the right, allow us to control the 3D output, and so I mentioned this wheel that we have and we go back and forth between programs, and this example we took our building footprints and we had to get windows on a curve wall and awnings and a curved wall, and we wanted to iterate through a bunch of different concepts, and to us CityEngine was a perfect utilization for that and so we use CityEngine, we take that model, we bring it into our final rendering.

On this project, I know, we had committed to the client one visualization, and what we had found with this workflow of moving back and forth between different software packages that we were able to give them not just an option A, but an option B, a less dense option.

And so, with the time that we're able to save with our approach, we're able to pass that savings on to that client.

Another way we kind of bring the tools together, this is a City in the middle of the United States, in the middle of Arkansas. It's called Bentonville Arkansas, it's the home of the Walmart Corporation.

They were getting a lot of growth, Walmart is a huge employer at the corporate level, and they were starting to see a lot of suburban sprawl and disconnected subdivisions. You can see you have these two neighbourhoods right next to each other they're not connected, this one's incomplete, really just haphazard growth. So, they asked us to help them through a strategy to grow smart. So just sketching over the top of an aerial, we kind of GEO referenced this photo when we sketch, this is how we should connect, there's this right peering corner we're going to connect.

We sort of faded out, we trace in the streets on top of, this is not CityEngine again, we trace in the streets and what we do is we take those roads and we apply rules where we now have these 3D roads, we subdivide out the lots, so, now we have a plan, a subdivision, we know how this neighbourhood is going to be filled out. Then we apply the rules and what we do is, we have a library of 3D assets that we've created in SketchUP.

We go in and we raid all those houses, they're SketchUP assets, done in SketchUP and we use CityEngine to call in these assets to build this scene for us.

This whole visualization was done in about an hour and a half. And I could tell you, if we had just tried to tackle this from scratch without this approach it was probably easily a few days, having to draw in all those roads and crosswalks, sidewalks and houses.

You know with our Geodesign toolbox and going into grabbing the right tool allows us to really tackle things quickly and the benefits of the client is quick iterations, so we're getting feedback, if we find we've missed the mark, we can make revisions, we haven't exhausted the project budget. A few years ago at the Ezra User Conference, we took first place for 3D map, it was a project we did, we called it an economic win for Geodesign.

We've been working with a City in Wisconsin sort of a northern state in the United States, it was known for furniture manufacturing and we had done a downtown revitalization plan.

Their economy had sort of fallen on tough times and they were trying to kickstart the revitalization of their City Centre and our plan included all of the typical planning documents, planning graphics you'd see, land use, transportation transit.

But this one was key priority sites, we identified the sites that we felt the city should place a priority on redevelopment.

The Green ones would be, you know, the sites that could add value, weren't necessarily a priority, but if they were able to redevelop they would add value to their downtown.

The ones in that gold colour these were redevelopment priorities, dilapidated uses, vacant sites, large sites under single ownership, the city should place an emphasis on these. Then the ones in red we said, these were catalytic, if these re-develop they're going to spur investment around them, these were the game changers. On those gold sites, we used SketchUP again to develop some quick concepts, just show massing, this is how this site should build out, buildings close to the street, parking in the rear.

Town homes lining the street with a rear courtyard that has the garage access.

So simple illustrations convey a planning concept and support the rest of our document, but when we looked at the catalyst sites the city told us there were five priorities, this number five here was to attract employers and jobs to the city Centre.

We looked at this area, this area was called the sawdust district, I mentioned it's in the northern United States, it was a large furniture manufacturing area, a lot of lumber came through here and they would make furniture when US manufacturing went to China and Mexico.

Now this area in Wisconsin had lost all this work, they call this the sawdust district, it was run down, dilapidated and they wanted a vision for this key part of their City.

So with pen and paper we sketched out, again we're showing some major employers down here they told us they wanted a basketball arena.

There were a couple things in here they weren't really upfront with us, they told us they wanted some class A office space and they needed a basketball arena.

Another SketchUP illustration here, where we put in the basketball arena, we put in some class A office space and we visualize to them what the sawdust district would look like. What we later found

out was the basketball arena was for an NBA team that was looking for a stadium for their farm system, it's called the G League, I think, the Gatorade League, so it's minor league basketball.

The Milwaukee Bucks saw this, said it's perfect let's build an arena here, before our plan was even finished for the City they were under construction building the arena, it is now home to minor league basketball.

But what we learned was that the office space that we had prepared was for this company called Oshkosh Corporation.

A billion dollar fortune 500 company that makes the humvee for the US army, they were getting pressured by the Federal Government to consolidate all of their operations onto one site.

What they said was that the the class A office space we had shown in the downtown wasn't the right site for them, and they had issued an RFP to Cities across the United States to get proposals to relocate their company, and we did some work and we told them that.

The City of Oshkosh had told us there was nothing they could do because they were looking for 40 acres of land on an interstate and that the City told us that they didn't have any property that met the criteria and they were about to lose thousands of jobs. We did some work in GIS and we told them, you know you have a site that that fits their needs, it's the City golf course.

And whether or not you want to have this conversation but everything that they're looking for you own, it's your golf course.

And they told us well if you can help us envision what this looks like and have the conversation with our residents, we would be we'd be open to it.

And so we started to sketch out what it might look like, the golf course was 65 acres the Oshkosh Corporation only needed 40, so it'd be 25 acres of residual open space.

Using SketchUP we planned out what this campus would look like, which you're seeing here, these brightly coloured shapes, this is this workflow where we design in SketchUP and we pass those brightly coloured shapes into CityEngine to transform it into a 3D model. So we prepared this and prepared these renderings, we were driving up to Oshkosh from Chicago and they told us that the meeting was getting moved from City Hall, to the Convention Centre.

When we got there, there were people with signs, save the golf course, save the open space. We went through our presentation and we laid out all the jobs that would be saved, what it meant the local economy.

How, it would be 25 acres of public open space, and not just a golf course but parkland. The first gentleman stood up and he's like boy, you know we could find a new place to golf, but if we lose all these jobs

This city is sunk. So, they ultimately decided to sell the golf course to Oshkosh Corporation.

It was something that earned us a special achievement in the GIS awards from esri, but to us the real win was the fact that Oshkosh decided to purchase the property and make it their global headquarters, an architect came behind us, did these renderings, they broke ground in 2018 and the building is built now, and this is their site.

So, I don't know if at this point we had become so comfortable bouncing in and out of these programs, where we became cocky but we started to have sort of fun with 3D, and so we took our office and every now and then at lunch we'd unwind and play some video games and have some good fun, office rivalry where we fight each other in a video game called counter strike and we sort of started to think, me and another one of my employees that does all the 3D work with me and Nick, we started to wonder if we could build our office, and so using SketchUp, CityEngine, Photoshop and ArcGIS Pro we wanted to see could we get our office into this video.

So, we started taking photos around our studio, we had the floor plan, my brother was the architect he gave us all of his CAD files.

We started taking these surveillance photos our staff was wondering what was up, we didn't want to tell anyone we wanted to surprise them. Started measuring all the furniture, and then we started to sort of draft it all out.

How big are the desks, the monitors, we took all of these assets and by way of SketchUP was able to sort of shoehorn this into this gaming engine. We started to look out of our windows, we're right in downtown Chicago where we have these iconic skylines, high rises, and we said well it would be a mess if all of our windows had our blinds down, you couldn't see the City of Chicago, so let's see what the city of Chicago looks like, so we built a 3D model of downtown Chicago and in GIs.

Then using CityEngine we created these view spheres, and we said well the one thing about a game engine is it needs to be fast.

If you're throwing a grenade at somebody or fighting with someone the game has to render all of those 3D objects, so it needs to be optimized and so there's 4000 buildings in the city of Chicago, probably 16,000 or more facades. What facades can we see from our office? We built this visualization analysis and we said OK what are the facades we can see and then every facade we can't see? Let's get rid of those buildings, so we optimized it.

Then we started to look at Randolph Street which is this iconic street where our office is, the Theatre, City Hall.

We started to mass it out, we looked at the pavement, and this is something I think is a nice detail, when we do our 3D work now, we try to make our textures a little weathered.

You know a lot of 3D has these pristine streets and painted lines and the reality is a street looks like that for like one day, until a car drives on it, and then you have the tyre marks on it. So we started really just to kind of see, we developed these textures in photoshop where we took a road and distressed it and added cracks and started to bring this into the game engine, these are just some crude sketches. So really just with an iPhone, SketchUP and CityEngine we sort of built this out and

so this is the photo, this is the shot of it in game, and these are you know our offices, windows broken, someone probably, this is my office, threw something at me.

What we found is the game mentioned has a beautiful real time rendering quality to it, so we started to kind of see what this area looks like, and it really cued us into the potential for game engines as a way to showcase our work.

This is a video I won't let this run for too long.

You can certainly see the detail that that we did, and all of these props and everything done inside, all the interior work was SketchUP everything on the outside was GIS. It was a really good marriage between the two technologies to come together and something that we thought was remarkable when we finished, I was working on a blog post and I wanted to see how close we were between our 3D model that we built in this game engine and how close we were to what existed. So, I sent someone some screenshots and they said, well, what does it look like in in street view, can you show us what street view looks like?

So, this is a Google Street View looking down Wall Street, our office is on the second floor of this building here, and when we transition to what we built it's uncanny how accurate it was. This is that view on Randolph.

So we did this for fun, we posted it on YouTube and our phone rang and it was a city outside of Raleigh, North Carolina, getting a ton of development. They said we think what you guys did in this game engine, we need for our town Centre.

They had two areas in town that were very important to them this ToD East and the McCrimmon Extension. But they had this as well as they went through a planning process the residents kept telling them how important their downtown was and they were using this to guide their vision for downtown and.

Now I don't I don't want to disparage any urban designers or whoever created this but I don't even know what this is telling a Community I don't know how a resident could look at this and get excited about the town Centre.

But this was there guiding policy for this town centre area and the planner saw our video game map, he's like hey can you come down to Raleigh and help us with this, in arial by the way, right now, Apple is investing a billion dollars into this research triangle area.

And so, this workflow we told them what we were going to do, we would look at ArcGIS Pro, we'd SketchUP some concepts, we'd go to CityEngine, Photoshop back to CityEngine into SketchUP, back to CityEngine, into webGIS into Photoshop back to SketchUP, into CityEngine then the final product, and so, to give you an idea of how quickly and often we're switching back and forth between programs.

This is exactly what we did, and then ultimately we ended up in the unreal for game engine. And so here's this area, this is what they envisioned their Town Centre to be, the existing use, you can see the density around, you have some row houses here, some single family homes.



The city had invested a lot publicly, a town hall, a lot of civic buildings here, but these areas were sort of back country small single family homes, some of them were vacant some had caught fire and the owners left, and so the city wanted to see this entire area redevelop, so everything in red they said was 'our new Town Centre.'

And so we looked at the market, we analyzed the market potential, we looked to see what retailers might be interested, with what the opportunity was.

We had them send us photos of the types of development they would like to see, so what do you like, what do you not like? So they went around within their city and some of the adjacent cities and sent us some photos and we prepared a couple of alternatives if I toggle back and forth between these two you'll see, nothing changes because the land use program was set, what they wanted and what they're wrestling with is the issue of density and alternative one was higher density taller buildings, parking structures, alternative two was surface parking lots, one storey buildings, sort of a more rural character.

So inside of CityEngine, our workflow we updated the area we referenced in some sketches that had been done, we traced in a street grid.

And when we apply our rules for the roads that dotted area, those become now the redevelopment pockets, so after we have our roads we're left with these yellow areas, these yellow areas come out and we bring them into SketchUP where we start to plan.

How deep are the buildings, where's the parking going to go, how's the onsite circulation work? We plan it down to the detail, each block became its own little site plan exercise. I mentioned in that example in Oshkosh where we have these brightly coloured shapes.

The other thing we did in SketchUP there were some buildings we knew that weren't going to change, these were municipal buildings those all stayed we modelled those out in SketchUP, so we did 3D work we drew in the Church, the Town Hall, the Planning Office.

So we brought it into CityEngine and then in CityEngine we built the dashboard, so as we extrude buildings we're getting real time feedback.

How many square feet we're adding, how many dwelling units are going in each condominium building, how many square feet of retail, how many office jobs, how much parking, do we need parking was a big one, we had to make sure this thing parked.

And so the two different options, option A and option B, you can sort of see this area here we had a parking garage and some additional height.

We pass this on to our client they gave us some feedback.

We brought that feedback back into CityEngine, again built out those dashboards so we knew what exactly we were getting in terms of square feet, we took their local zoning code, so if they had one parking space for dwelling units, if we increase the height of a building well, that means we need to add additional parking, and so we need to account for that parking somewhere, that might be we add another story to the parking garage. So we're getting this real time feedback, you can see I just



changed the height of that building and the parking shutup, so now this plan wouldn't be in compliance, I'd have to go on to that parking garage and increase the height of that parking garage, add another story to make sure this parked. So we went back and forth with our client looking at the different scenarios and how this could be masked out.

And what we did is we published a 3D web scene, and I can give you a link to this at the end of the talk, and our client was able to go on in a browser and jump in and view this development and explore it, and so they could toggle between, you can click on any building and this program reports out how many dwelling units, how many square feet.

This was a concern to me when I came into the web and I went down the Main Street here, I thought we were creating a cavern I thought this was going to have a real cavernous effect, I was worried that the Community would reject the buildings for being too tall.

But we brought it into UNREAL which runs the game Fortnite.

Hopefully you've heard of that it's pretty popular right?

We had about two weeks to go from here so the 31st is when they told us they wanted us to move forward with the game engine, they did it on the 13th, the big issue here is Nick Davis is out, he's out of the office, and then the following week Nick is out and I'm out, I'm in Florida. And we had to get this done, so I'm at universal studios.

Nick's up in Wisconsin and we have to take this and get it into a game engine. So Nick spent his summer vacation in SketchUP, building out the 3D assets, designing the park sites, you can see he added all of these trees as components.

They would later be brought back into UNREAL and replaced, I spent some time in Photoshop creating textures, I mentioned those roads, for us it is important to kind of show whether they have cracks, manholes, patches, created a whole library of streets and then made basically, this line of code randomises those streets, adds cracks, adds manholes, adds patches, and so you take a street and just from inside of CityEngine we could kind of make it look like it's a real road. So we delivered this to the Community, Scenario A. less dense, Scenario B. more dense, and again every single one of those buildings has attributes tied to it, A and B, and we also added playability, we gave them an Xbox controller and they control this Avatar and walk it through the downtown and they can toggle between scenario A and scenario B and can go anywhere, they can explore it, there were a few points where we thought people would have a lot of concern over height.

We showed up at their town hall meeting their City Council had us walk through the different scenarios and for 10 years this Community had not been able to make a decision about what to do with this town Centre. they weren't sure if they wanted one story rural or multi-story with parking garage, sort of a more urban, after about 20 minutes of us walking around this digital world the Mayor stood up he goes, well, my mind's made up, I don't know about everyone else? And someone said what were you thinking Mayor and he said, I think we got to go for dense, I think this looks fantastic! And unanimous right there on the spot the City Council agreed and we helped them with this design challenge.

So pretty great story, and when we left the town hall the planning director came to us and said, this is the best money the city has ever spent.

So I mentioned the workflow was complicated, you know we went from GIS we sketched some concepts, we brought it to CityEngine, we put those roads in, we use photoshop to match in the new aerials, used SketchUP to help us design the sites, back into cities and create those dashboards, the client reviewed it we created those web scenes, photoshop for the textures, SketchUP to model existing buildings the props and the trees, and then ultimately unreal, and so this won a special achievement at the GIS awards last year.

Then the last one I was going to say, I wanted to tell you how it feels like all of these projects have sort of snowballed into work, someone sees one thing and wants it. There was a City out here in Chicago that saw that work in Morrisville and they said boy we want that for us.

So, it's a 35 miles west of Chicago we have these commuter, it's not far from where I live, we have computer lines to take us downtown.

You know, we were going through a planning process with them for their entire community and we did a lot of community outreach, outreach is a critical part of Geodesign, we use a tool called, 'Map.Social, where residents can go in and create their map of their community, and we got all this great feedback on a map.

And we customize the legend, so people can go in and tell us what's important they can draw polygons, they can draw where they want bike lanes.

And everyone's map is unique and what they don't know they're doing for us is they're building a GIS data set for us which allows us to pull everything together to sort of see what the Community wants.

And what we learned in Glen Ellyn was that this downtown, the historic downtown was something very important to them, they wanted to see it be compact, they want to increase residential density, they want more stores, they love downtown and they want to see it vibrant.

So you know a typical land use plan, but one of our key objectives here was to keep downtown vital, the goal community appearance.

You know, seemed like every recommendation this plant talked about downtown being vital, and this is what it looks like, I think a you know traditional American in-line storefronts, wide sidewalks, of course a Starbucks (I'm surprised it's not a Dunkin Donuts).

They got a movie theatre, but despite what they told us in the meetings and I don't know if you've ever experienced this? They tell us do we want to, increase density, we want vitality but every development that was brought forward was shot down; it's too tall it's too dense, we don't like the look of it, it's the wrong materials, we don't like the parking.

And, time after time after time all these developers were getting shot down, and so the city asked us, can you build us the ability to take these drawings that we get from developers and put them into a game engine, like you did in Morrisville? This one was a little tricky we had to work with grade,

we took Lidar information, we took a point cloud, we found the heights of all the buildings, extruded all of the building footprints to the height in the Lidar. There's a Lidar extraction tool that ESRI has where you can identify where trees are from Lidar information, so we got out these sort of Lego looking trees.

And then we started to work in CityEngine to build the 3D model of their downtown.

Grade was an issue because there was a building that was getting proposed that was going to use grade to its advantage, and I'll show you that in a second.

So this couldn't just be a flat area, we had a site that was dropping down four feet that wanted to kind of sneak in an extra half story, and that was a point of contention, and so we took the Topo and we built a digital elevation map, we brought that into CityEngine and we started to lay our geometry, on top of it, you can see, when we do that we get these, you know these buildings, want to sit flat, we can have them hug the ground but it wouldn't be a true thing, and so we have to write rules to kind of extrude the building up and also extrude it down where you have a foundation, and you can see the road coming through and the same with the streets.

And so inside of CityEngine we did all of these roles to kind of map out the existing buildings, and we still had some real goofy stuff happening there, what we ended up realizing, we have to do is kind of tessellate all the shapes and this allowed us to really just drape this right over top of the terrain so everything sort of a hugged nice and tight.

oops going backwards.

And then, a couple of other things that were important this is the existing building, there were buildings that we called, 'hero buildings,' this is a public library, this is a google street view, we took that, we modelled it out in SketchUP.

We wanted to make sure this development be proposed across the street from the library. This is it inside of the game engine, this was the development being proposed, this was the one that one of the ones that was too tall we brought it into SketchUP and into the game engine.

And this is yet another development that was getting proposed, brought it in and five, sort of quickly tab over what we what we built for this Community, I mentioned a sort of playable game.

It's the same sort of experience, where they can they see existing conditions or the proposed development, and we also gave them the ability, you can see, as soon as I stepped on this street it's going to read the GIS information and tell me which street I'm on.

And so they were able to evaluate this development in real time.

And so we're still building on to this, we also gave them the ability to capture their own photos so if you want to take a screenshot they can.

And so, this was this site where they can see the site's grading down or they wanted to kind of sneak in that storefront.

They were anticipating a long drawn out Council meeting, the meeting lasted about 20 minutes, the planner could not believe it.

One of the quickest meetings they've ever had, and they gave all the credit to us for giving them the ability. So a traditional planning process here, a plan is prepared staff reviews it, gives the developer feedback, he goes to planning Commission, planning Commission gets feedback, then it goes to City Council, City Council gives feedback, this Community has modified their development process to now, a model submitted by a developer.

We asked for it in SketchUP, we bring it into our GIS, into CityEngine, we publish it into that immersive game engine and their staff can review it, their City Planning Commission can review it, and so what they do is they charge a developer now like 1500 bucks to pay for our time to update this engine and so that's all I have for you, I'd be happy to answer any questions, who wants to leave some time at the end for some questions? Those are some of my contact info.

Some of those web scenes you can get to at [hla.fy/arcgisonline](http://hla.fy/arcgisonline) you could also reach me on Twitter or LinkedIn. I could send you any link and so with that I hope you enjoyed it and be happy to answer any questions.

HUSSEIN DIA: Thank you so much, that's really very interesting and you know a great use of digital tools and innovations. I have just maybe a quick question, I noticed in one of the slides where you were showing how you move in and out of different applications, you you made it sound very easy but I wanted to ask, different tools, is it an easy transition and integration, and seamless integration of data, or do you have to do a lot of your own coding to import and export between packages?

DEVIN LAVIGNE: No, I mean, so we don't do any coding to export and import.

What, Collada, is sort of a platform neutral 3D, almost like a DXF, what DXF is to a DWG file in CAD, Collada or a .dae file is a software neutral 3D, so everything I think sort of ends up and either Collada or as a KNZ which KNZ is a Collada file it's usually wrapped up with geographic coordinates to place inside of Google Earth. That's really how we get back and forth, where it can get tricky is when you stray from a 00 coordinate.

And so, when you start looking at a place on the earth, we have latitude and longitude and SketchUP loves things to be close to 00, I mean you can GEO reference things but when you start getting far away from that 00 access SketchUP can kind of visually glitch out at times, game engines forget about it, I mean you need to be as close to 00 as possible.

And so what we end up writing down is sort of a geographic offset, so if I'm in GIS I look at my latitude and longitude of my site, and I basically write down how many hundreds of thousands of feet do I have to offset North and East to get this thing back to 00 inside the game mentioned.

And then we almost always include what we call reference squares, so if we're designing something here, off on the side, off of the canvas or these squares that we know we can match up off camera to make sure everything sort of clicks together.

HUSSEIN DIA: Thank you, we have a question from one of the participants it says, I was wondering if there was land use spatial data available for the US. Data like portions of land used for committed activities, residential blocks, parkland etc.

DEVIN LAVIGNE: Um no not really. There are, I mean there are some data sets that you can purchase there's nothing available for free, when we do a study we almost make it our first step to go collect it by driving around.

There are things like open street map that would have some. But I think as the democratization of geospatial data is happening and ESRI has been really pushing this, first place I always look when looking for data is I'll type in like, City name, open data portal, and if they've implemented Esri's 'open data portal' it'll show up and I look for parcels.

But there's no national data set for land use.

HUSSEIN DIA: I had another question, you showed some really very interesting examples, but probably these were pre-covid. I was wondering um it's not it's a technical question, but as a city planner, as an urban planner are you noticing some changes in client requirements, especially perhaps you know regarding densification, regarding more use of outdoor spaces and similar?

DEVIN LAVIGNE: Oh absolutely.

I would say density was a was a bad word here 10 years ago, and what we're finding is that communities are starting to embrace density, there are some housing, there's a housing crisis in the United States, I mean we have some cities in California where people are just living in their cars and campers.

So, we're starting to see more intensification of our built out areas and more, I mean, I live in a what I call the traditional suburb, it's called Naperville, it's mostly single family, just approved what's called a micro unit development, they turned a motel into apartments so the apartments are only 350 square feet each, so I think people are trying to solve this housing crunch that we're in creatively, in ways that before I don't think we would have solved.

HUSSEIN DIA: Another question, in Australia here the concepts of 20minute neighbourhoods has been suggested a number of times, is that a thing in the US, and what are your thoughts on it?

DEVIN LAVIGNE: Do you mean like... I'm trying to think, we had a principle that I teach, I taught at the University of Illinois where the neighborhood unit is almost a self-sufficient area. yeah and I think it's I can't think of his name - not Clarence Perry. Yes it is something we do, there are still Cities we work in, let's say I think the challenging part of being a consultant is I can't go into the Cities that were working in and give them my vision for their community.

I'm not a resident there and I work all over the United States, what I need to do is listen to a community and help them articulate their vision.

What we do do, though, is we tell them that you know, there isn't enough multi-family, and we help them down a road where you know we know you want all this area to be residential but the people

who live there are going to need places to shop, and they're going to need parks and they're going to need schools, so we do balance land use, I don't know if we stay strict to the neighbourhood unit principle, but I'd say it's something almost in our DNA that when we start planning out these areas we try to make sure that at some level their self-sufficient.

And the other thing that we do do a lot of promoting to, is access to what really public health has become such a lens here, so access to healthy food, how close are they to stores and to markets, community gardens, parks and open space, and it's really I think, yeah I'd say at this point, I'd say that's in our DNA and I don't know if it's something that we evaluate after the fact, but as we're playing you know we kind of make sure that it's a balanced mix of users.

HUSSEIN DIA: Thank you.

There's another question, so any special tactics to share with us for getting people, those especially not digitally gifted to engage with some of the tools that you have shown us?

DEVIN LAVIGNE: To, use them or to learn them? I guess, would be my question, how do you learn them?

HUSSEIN DIA: To engage with them, probably, I mean yeah sometimes do you find resistance, for example from the client. Yeah.

DEVIN LAVIGNE: So the outreach tool, Matter Social, I built that. And I use my mom as my test subject. Because, at the end of the day the user is going to be a resident in a community, who is my Mom right, if a city planner is going to be developing or come up with a plan for her city, she's going to be and people her age are going to be the people that are providing input.

And so I was constantly saying hey Mom can you go in and make a map of your community, when she lived in Windsor Ontario.

Can you make a map of Windsor? And get her feedback, and so we did test it out with really the parents of everyone in the office and was only then when we were satisfied that people could use it, when we rolled it out.

I've heard some people say, well CityEngine is too confusing and SketchUP is too confusing and they need to make it easier.

And you know it needs to be so easy I even heard someone say like you know my Mom should be able to use it, I'm like my Mom isn't using SketchUp or CityEngine or Photoshop, I mean these are professional tools for professionals.

It's the reason we get paid what we get paid and why our skills are sought after.

So there is a steep learning curve to this technology, I would say of all of them though, SketchUp is probably the easiest, it functions like how you draw with pen and paper. and

Where as I see people who struggle with SketchUP, or people that have learned like 3DS Max, or Autocad or Revid and then try to learn SketchUP and I think because SketchUp is so intuitive

I think they struggle with it, but yeah, I don't know I mean the games for sure, I think what I saw in that community in North Carolina was like the Mayor was like my age and I'm in my mid 40s, I grew up playing video games, I sit down at the keyboard and my hands go to W.A.S. and D to move a first person character through a world, it's just sort of a natural reaction. So I think as the generation grows up and these people that have always played video games their entire life I think there's just a ton of potential for the game engine to be a good vehicle to get people into technology.

HUSSEIN DIA: Thank you so much.

I'm just conscious of the time, actually we're spot on. Coming up to the one hour.

Thank you so much that was really enlightening and really good to see the visualization, and again I think you made it look very easy but there's a lot of expertise and experience in what you do, so thank you for sharing that with us, and thank you for staying up late to present to Swinburne. Also thank you Chris for facilitating this seminar, and we look forward to more of these in the near future. Thank you everyone for attending as well, and thank you, Paul for your help in setting it up.

DEVIN LAVIGNE: Great. Thank you so much.

[END OF TRANSCRIPT]