##### [00:00:00.990] - Speaker 1

Hello, and welcome to this demonstration of Community Viz. Here we are using it for wetlands management in a site development proposal. This demonstration is a collaboration of work from Placeways and the Northeast Connecticut Council of Governments. The site we are working at is in Killingley, Connecticut, right down the street from Nikol. This intersection is called the Four Corners area.

##### [00:00:21.660] - Speaker 1

It's recognizable for its big Dunkin' Donut sign. This historical tree, the Zip Steiner, and a number of other commercial establishments in this area. To give you a sense of context, let me just pull back a bit here. In the scene, I'm actually moving around, flying through the scene, not just playing a recording.

##### [00:00:42.340] - Speaker 1

This is a highway interchange. The zoning and activity around this area gives us the idea that we might be able to do some additional commercial development. So for this demonstration, we're suggesting that there could be new development on this hill, possibly a hotel, restaurant, storage, etc. What we're going to do is analyze that proposal using Community Viz. What I've been showing you so far is called Scenario 3D, which is a component of Community Viz.

##### [00:01:07.830] - Speaker 1

It's a free 3D viewer, one of three different options for making 3D scenes with Community Viz. You can see back behind here is Scenario 360, the analysis component of Community Viz, which is an extension to ArcGIS desktop. So essentially, we're starting from ArcMap as Reese's ArcGIS mapping tool, and we've added Community Viz as an extension. You can see this is the exact same data, photo and geo database. I'm just now showing it to you in 2D.

##### [00:01:37.440] - Speaker 1

You can see again, the highway interchange, the Dunkin' Donuts, zip steiner, and the tree. This area over here is the proposed development site. The additional thing I've sketched in here are these green shapes which represent hypothetical wetlands. They are fictional. For the purpose of the demonstration, what I want to show you now is the proposal.

##### [00:01:56.080] - Speaker 1

One way I can change views. In Community Viz is called save views. It brings up different windows exactly when I need them.

##### [00:02:05.660] - Speaker 1

So here is the proposal in 2D. It's just been sketched in, but if I had a developer's plans, I could use those. Here you can see the hotel and restaurant. There's a road that goes back to the storage complex and a couple of potential future sites. The rest of these green polygons are just sketched in grass, which we'll talk more about later.

##### [00:02:25.160] - Speaker 1

So that gives you an idea of what the development looks like. It might be clearer if we look at it in 3D. So let's do that. I've just brought up the viewer again, and I'm going to activate this proposal. I'm going to fly over to it.

##### [00:02:38.740] - Speaker 1

You can see now that we've taken the layers and the shapes from the 2D map and turned it into a 3D scene, that process isn't too bad. It takes a few hours or longer, depending on how fancy you want to get here is the kind of thing that might be proposed. You can see the hotel here, you can see the restaurant here, and if I pull up a little bit, you can see back through the woods. And there's the potential storage complex. That gives you an idea of what the proposal might look like.

##### [00:03:19.520] - Speaker 1

Taking it back to 2D, let's think about some of the impacts that the proposal might have. Community Viz has lots of tools for calculating impacts. One of the ways to show the results of the calculations is through charts. Let me show you some of the charts that have been created in Community Viz for this site.

##### [00:03:37.350] - Speaker 1

Over here on the left it says impervious acres and that is a calculation for how much new pavement there is. This is based on just parking lots so far. And I'm showing over 20 acres in paved area. Here is wetlands covered in acres. Since I put the storage complex right on top of the wetlands, I've covered over five acres of wetlands.

##### [00:03:55.550] - Speaker 1

I haven't completely ignored permeable surfaces such as grass islands shown here in this example. In this calculation of pervasive percentages for parking areas, looking back at can see these grassy strips in the parking area which are reducing the total amount of impervious surface on the hotel site. It's at twelve 3% right now. Another thing we've done is thought about trees. The idea with planting trees is that they may add some shade, some cooling, and they may also help mitigate a loss of moisture during the summer time.

##### [00:04:26.930] - Speaker 1

See this tree canopy ratio? It's the area of leafy trees divided by the area of parking lot. Right now less than 1% of the parking lot would be covered when it's first built after ten years. Once the trees have matured, it would move up to one and a half percent. You might be starting to wonder where all these numbers are coming from.

##### [00:04:45.260] - Speaker 1

Well, they're coming from formulas and models. And part of the results that those models are giving us is from what we call inputs or assumptions. If I right click one of these charts, I can go to the view chart Assumptions and it brings up this new interactive control for my assumptions. You can see new tree canopy that shows the size of each tree and the ten year canopy that shows the size of trees after ten years. Over here is the current value.

##### [00:05:12.120] - Speaker 1

These slider bars allow me to adjust those values based on the newer data or different information received from the developer, etc. So I can adjust these values and hit the update button. Then the model recalculates, much like the way an Excel spreadsheet recalculates when you put in new values. Now my chart has changed. The hatched marks show previous values and the solid bars are the current value.

##### [00:05:36.020] - Speaker 1

So my ten year mark went from one and a half percent to about two 7%. This is not the whole story though, as there are formulas and models behind here. So let's take a peek at how this analysis is being accomplished. To do that, I'm going to come to this control the Scenario 360 content window. It gives me access to all sorts of different tools and it also gives me very direct access to all the modeling that is being done.

##### [00:06:01.200] - Speaker 1

For example, I can go and look at the indicators. The values that the charts are showing are called indicators. Here is a list of all the indicators in this analysis. And here is tree canopy ratio. After ten years, if I double click on that indicator and then move to the formula tab, I can see how the values are being calculated.

##### [00:06:21.170] - Speaker 1

I can edit this formula. This is a very important part of Community Viz because it makes it completely transparent. You can go in and see everything that it's doing, find out more about it, challenge it and change it. The formulas can be simple or complex. This one is a simple percent value, so it's 100 times the tree canopy area divided by the hotel parking area.

##### [00:06:43.730] - Speaker 1

However, if you wanted to do a more complex formula, you could. You can do very sophisticated modeling because there are so many kinds of calculations available. Here are all the functions you can use when you modify formulas. You can see there are a lot of geospatial calculations such as angle and distance. You can run external scripts that run other kinds of programs.

##### [00:07:05.300] - Speaker 1

You can do topology, there are statistical functions, there are functions for manipulating text, etc. You have a large toolkit that allows flexible analysis to do just about any calculation you can think to model.

##### [00:07:21.080] - Speaker 1

Let me show you something that would typically come up. Remember this new Impervious Acres that I said was just parking lots? Well, in a proposal like this, there's a road. Also the road should be brought into this calculation. So I click on the new Impervious Acres indicator and I edit the formula.

##### [00:07:38.840] - Speaker 1

And then I add in the roads by adding a plus sign. And then I add the indicator that has something about road area.

##### [00:07:48.380] - Speaker 1

I can check my formula and it shows no errors. So I hit OK, watch how the chart changes. Now I'm showing more impervious acres. This gives you some feel for how Community Viz analysis works. It shows how you can start more simply and then get more sophisticated as you like or need.

##### [00:08:10.050] - Speaker 1

Back to Mitigation, I mentioned how there were some grassy strips and trees. Maybe I want to be more radical about that and make such big changes that I want to create a whole new scenario that is a Mitigation plan. Maybe this would be a different way of implementing this development proposal. Community Viz is now going to bring up for me side by side comparison of these scenarios. That's one of the reasons it's called Scenario 360.

##### [00:08:33.210] - Speaker 1

In scenario 3D because it's good at looking at those sort of alternative what if plans. Here you can see the side by side viewer. This is the original proposal and this is my mitigation scenario.

##### [00:08:47.930] - Speaker 1

If I zoom in here on this, you can see that I've made the grassy strips wider and I've added more trees. Taking a look at this in 3D, this is the proposed plan now. And now I'm going to show you the mitigation plan as in two D. You can see that the grassy strips are wider and they have more trees. I'm showing the ten years rather than the newly grown trees.

##### [00:09:07.780] - Speaker 1

This gives you some sense of the impact of the mitigation plan. So let's see if that helps. Now, these charts are showing results for both proposals side by side. Here s the previous percentages. In the original proposal.

##### [00:09:20.650] - Speaker 1

We had 12.3% on the hotel site and the mitigation scenario has 27 9%. That looks like a pretty good improvement. Similarly, the tree canopy ratio has gotten quite a bit better. So that is a couple of examples of what I might do with mitigation. The final thing I might do is solve this obvious problem I gave myself, which is putting the storage complex right on top of the wetlands.

##### [00:09:45.140] - Speaker 1

That probably was not a good idea. So what I'd like to be able to do is try putting that storage complex somewhere else instead of right on top of the wetlands. The way I'm going to do that is by editing the map. Here I brought up my wetlands covered chart and it's showing me 5.7 acres because I haven't moved the storage complex yet. So I'm going to start editing and I'm going to select that feature and move it.

##### [00:10:09.380] - Speaker 1

If I move it just a little bit, you'll see that I've saved some wetlands. Now there's only 2.3 acres covered. But if I want to move it farther, maybe to a new location, I can get it to where I'm covering none of the wetlands. If I want to look at that now in 3D again, I have to do a couple of settings with scenario 3D. Then I'll have to re export those layers that I've changed and that will take just a couple of minutes.

##### [00:10:34.200] - Speaker 1

And when that's done, I get something that looks like this.

##### [00:10:39.750] - Speaker 1

You see that it is the same hotel, but now over on the other side of the road, I see my storage units. This isn't quite perfect because I didn't tear down those trees and build a road, etc. But I think you can get a sense of what it might look like to move the storage units over there. So that is the conclusion of this demonstration of some of the ways you can use community viz for wetlands management and other water management techniques. At the site scale, I want to emphasize that Community Viz works equally well at larger scales, such as an entire watershed or region.

##### [00:11:08.360] - Speaker 1

You can use it for many things, but I've just been illustrating site level water and tree impacts on this particular development. You could also look at economics, transportation, land use planning, etc. I hope you'll explore the community of this section of our website to learn more. But for now, thank you for listening to this demo.