

Regional GeoDesign for Land Use Analysis

Paul Zwick from the University of Florida presents urban and regional modeling scenarios for Orange County, Florida, through the MyRegion Regional Visioning Project.

<http://video.esri.com/watch/970/regional-geodesign-for-land-use-analysis>

Video Transcription

00:01 What I'd like to present, was asked today to present an idea or concept we've been working on.

00:05 And I was kidding with Carl the last time I saw him at a presentation. I love this, at least this time it's 35 minutes...

00:12 ...but I love this thing where they say, You have 15 minutes; tell us about your life's work.

00:16 Okay, we'll give it a shot, okay. So the...we've been working on this for a good while.

00:22 Peggy Carr is one of the most creative people I think I've ever met in my life. She's a landscape architect.

00:27 We work with architects, engineers, environmental scientists, those people like that.

00:31 My background is civil engineering, systems ecology, and urban planning, so I'm seriously schizophrenic.

00:39 And before I start, I'd, I'd really like to just take a short time to give this little anecdotic story that I think sets where we're at.

00:49 And it's, it's not meant to be funny, but it's meant to pontificate without actually looking like I'm doing that, I guess.

00:57 So there's a sparrow and a robin and they're up north. And this...it's, winter is approaching and the sparrow says...

01:06 ...to the robin, "We better get going. You know, I mean, it's...winter's going to set in; we're going to be in trouble."

01:10 And the robin says, "No sweat, don't worry, I've got it. I know the system. I'll take care of you. I'm your friend."

01:17 A little while later, a big storm comes in and it's starting to snow and freeze, and the robin goes...

01:21 ..."Wow, we got to get out of here. We're in trouble." And they start flying south and the sparrow says to the robin...

01:27 ..."Robin, my wings are icing. I'm in trouble." And the robin says, "You're on your own."

01:31 About that time, the sparrow starts spiraling down out of the sky and he falls in this really big pile of steamy...

01:38 ...moist, wet, soft cow manure. And he's going, "Man, I'm going to die and I'm in a pile of manure."

01:46 And he realizes it's melting his wings, okay?

01:48 And he's going to be able to live. And he starts to chirp and sing and everything and a cat comes by and eats him.

01:54 And there's some, there's some morals to this, okay. And the first moral is, not everybody that says they are your friend is, okay.

02:02 Secondly, not everybody that tells you they know the system does.

02:06 And the corollary here is, all models are bad, some models are useful, okay.

02:12 Another one is that every time you fall in a pile of manure, it's not necessarily a bad thing.

02:19 And the last one is, when you're warm and happy, keep your mouth shut, okay.

02:22 And I'm always scared when somebody asks me to do this, 'cause I'm up here starting to sing and I'm waiting for this cat, okay, so.

02:30 So with that, I'll try to go on. There are significant people that have helped us over the years.

02:34 Peggy and I started doing this. Abdunaser Arafat is one of my doctoral students.

02:38 He's now a postdoc at the University of Florida. I like to tease Naser - we call him Naser - that I'm Doctor Arafat's chair, okay.

02:45 And then the other one is Iris Patten, who's now faculty member at the University of Arizona. And where did I point this?

02:52 Oop, I'm pointing the wrong thing, okay.

02:54 The presentation today, I want to start with a little bit of an understanding about Florida so you know where we're coming from.

02:59 Talk a little bit about why I believe geodesign's important.

03:02 Look at the MyRegion project, which I think helped some of that.

03:05 Talk to you about what we're doing with LUCIS Plus. LUCIS is the land-use conflict identification strategy...

03:11 ...and the students came up with this really cool idea of planning land-use scenarios, so that's where the Plus came from.

03:17 And now they got land-use W and land-use E for water and energy and stuff like that.

03:21 And the fun part about being in academics is you allow your students the freedom to, to play.

03:26 And then what lessons are learned.

03:28 How geodesign, what the geodesign educational opportunities are in the school of landscape architecture...

03:33 ...and planning at U of F.

03:34 And then an interesting geodesign problem that I hope I can get to, but I'm a classic academic, more...

03:39 ...slides than I probably should have. So why geodesign?

03:44 I think it's first and formidably the best solution for this problem that we have that's called disjointed incrementalism.

03:51 And what disjointed incrementalism does, and I'm going to paraphrase Carl here, and Carl said that geodesign is...

03:58 ...geography changing, change by design.

04:00 Well, disjointed incrementalism is geography changed by institutional happenstance.

04:05 And the incremental changes that occur over time are done so in such a local decision way that with the absence...

04:12 ...of no regional context. And so what happens is you get what we call Florida sprawl.

04:17 And by the way, we do Florida sprawl really well, okay.

04:20 And what happens is you get this occurring, and you don't know it's occurring until all of a sudden it's there.

04:26 And to paraphrase Doug Olson yesterday, he might say that, that disjointed incrementalism is the vector...

04:33 ...for the global disease that he was talking about. So what happened?

04:38 How did we get all started? We did a lot of green waste planning and stuff like that. People started to ask us how...

04:43 ...land-use changed. And then he asked us to take a look at what Florida might look like in 2060.

04:49 And so we have this way that we deal with, and the population was going to go from roughly 18 million people...

04:54 ...to 36 million people, projections. That's not going to change much.

04:59 Florida has, even with the economic downturns and the, and the...the housing market doing what it's doing and everything else...

05:06 ...Florida is not going to change that much.

05:08 There will be something changing, but it won't be this idea that people are not coming to the

state of Florida for that particular reason.

05:16 And it's interesting to look at.

05:17 What we did with this is, we looked at, at urban densities, but we looked at them a different way.

05:21 We started to look at gross urban density.

05:23 We started to look at what the total population was and what the urban footprint was, and how could we use that?

05:28 Could we use that in a very, very large regional context, which was Florida.

05:33 And the interesting part here is, in people per acre, not units per acre, not square foot of commercial infrastructure...

05:40 ...or those kinds of things. People per acre. Alachua County has 1.7 people per acre.

05:46 Per - in the urbanized area - 1.7 people per acre, okay.

05:51 Miami Dade, and I don't know if you've been to Miami, but Miami is pretty dense. Miami Dade is about 15 people per acre.

05:56 Orange County is about 4. Gilcrest County, half a person per acre. And if all of a sudden they start, oh, you get to spill over...

06:04 ...and they start developing at a rate, they're developing it, that historic rate of a half a person per acre...

06:09 ...and you're eating up land like you wouldn't believe, and so what happens is, that's what Florida looks like in 2005.

06:16 The light blue is water. The green is existing conservation lands. We bought a lot of conservation lands in the state of Florida.

06:23 And then the brownish-red colors are the current development. The 2060 projection looks like that.

06:30 It pretty well puts to rest that inverted U that is supposed to be the megalopolis that starts in Miami...

06:35 ...goes up to I-4, crosses I-4, and comes back down.

06:38 The whole peninsula is going to be a megalopolis, by the way, by the turn, unless we do something different.

06:44 And that means we're going to have to structurally change the way we look at the world and the way we look at government.

06:50 If you did what, if you looked at what we did, we actually went from 6 million acres of urban to 13 million acres of urban.

06:56 We held the conservation lands constant in this model for a reason. They asked us to.

07:01 They wanted to know what the development would look like on places where they were proposing new conservation...

07:05 ...lands, and the only way to do that was to look at the modeling structure. So, how is...what is LUCIS?

07:12 Okay, what does it do? It's a process for land-use analysis and population allocation, which comes after the identification.

07:19 Using traditional suitability is, and to try and identify conflict.

07:23 So it's essentially a traditional suitability model with some really nice additions, I think.

07:30 The MyRegion project was done for East Central Florida Regional Planning Council.

07:34 And I want to give Phil Laurien, the director of East Central Florida, who's now retired...

07:38 ...and Claudia Paskauskas - that's a mouthful - credit for doing a lot of what we did. Taking what we did and adding, and adding to it.

07:48 Doing environmental, some environmental analysis, looking at REMI models for economic data and those things.

07:56 And so the project, to cut it short 'cause I want to go by some slides so I can talk more about others.

08:01 They really believed in this idea that their region was, was developing in this disjointed incremental fashion.

08:08 That it was the typical sprawling development within the areas. The view was that it was environmentally unhealthy.

08:14 The urban environment wasn't efficient and wasn't particularly exciting.

08:18 There was nothing about that urban environment with, with unit after unit after unit with a palm tree in the front yard and...

08:23 ...some stuff like that, that was particularly exciting. Nice weather, not particularly...

08:27 'Course, if you've been at Florida in July and August, I'm not necessarily sure it's nice weather, okay. So this is what it looked like.

08:34 And if we kept doing, since...since the year 2000, the region added 300,000 new housing units and over a half a million...

08:41 ...new residents, and it looked like that. In 2050, with some of the stuff we looked at, if we continue to develop...

08:52 ...the way we do, we'll have built 2,340,000 new units, single-family housing mostly, okay.

09:00 We'll commit to a pattern of commuter that will double the road network and traffic will get worse.

09:06 We'll have 344 square miles of sensitive habitat that will be lost to urbanization in just this

MyRegion area...

09:12 ... and you'll see where that's at in a minute.

09:14 I apologize for that. And we'll consume 2,577 additional square miles of urban land.

09:20 And at the time, we don't know what the heck gas prices are going to be in 2060, we have no idea.

09:29 MyRegion, the strategic planning task force had seven senior members on it and the regional board had 226 members...

09:36 ...as Doug was talking about. You get a chance to interact with people.

09:39 And these people are real estate agents, they're developers, they're environmental scientists, they're...

09:44 ...environmentalists, they're planners, they're just interested general public, okay.

09:49 And if you've ever been in a land-use meeting, the four-letter words come flying.

09:54 Okay, when you start to tell somebody that you're not going to allow them to develop or do something on their private property...

10:00 ...the way they want to do it, you can actually have your life threatened.

10:04 I was in Monroe County at one time when I was a graduate student, we were working on critical lands of state concern.

10:09 There were two highway patrols on either side of myself and my major professor.

10:13 And this person came up and said, "I'd like to give you both 100 acres of my land."

10:17 And John said, "Well, I can't do that. That's a bribe." And the guy said, "No, no, no, no. I want you to have 100 acres..."

10:23 ...of my land 'cause I want you to understand what it really means to me for what you're talking about doing."

10:29 And John said, "I'm sorry, we do understand, and, but we can't take the land."

10:33 And he said, "In that case, don't come down here, 'cause I'll bury you on it."

10:37 And I went, "That's a wallet issue. That's a...." When you're dealing with people's private property and you're doing...

10:44 ...land-use analysis, you're going to deal with some really intense issues, and I think Doug got to that the other day.

10:49 He had a person screaming. I'm a tenured faculty member of the university, I can say it differently, I think.

10:56 So what did it look like in 2005? The 2005 snapshot looked like this.

11:00 Now the color, I took these right out of their report, which, by the way, you can go online at...

11:06 ...eastcentralfloridaregionalplanningcouncil.org, or ecfrpc.org, and you can get the summary report for this thing.

11:13 It has a DVD in it, too. The urban area is 2,600 square miles. The habitat destroyed during that process was roughly 394 square miles.

11:23 That indicator I don't really understand very well.

11:28 Green acres, the green areas was about 2,100 square miles, or 24 percent.

11:31 Thirty-four-mile average speed for what's commute. Zero miles of passenger rail.

11:38 A hundred and 18 billion dollars of gross regional product in 2000 dollars, and the average wage was about \$35,000.

11:46 And the existing urban density centers looked like this. So that's an area.

11:50 Seven counties. It's Volusia County; Seminole County; Lake County; Orange County; Brevard County,...

11:56 ...which is where Cape Canaveral, Cape Kennedy is; Polk County; and Highlands - or Osceola County, excuse me.

12:05 And one of the areas of interest that later on is to do here, that, there's a big huge development that's been proposed...

12:10 ...down there called Destiny. I'm not sure, way out in the middle of nowhere like that, that would be my destiny.

12:16 I hope it's not, but the reality is there is that going on. So I apologize. You now know I am not a designer...

12:23 ...'cause there wouldn't be a designer in the world who would put up a colored map that would look like that, okay.

12:28 But what happens is, we ran the LUCIS process and we find out, we get conflicts, and I'll tell you exactly how...

12:33 ...that's done in a second. But it turns out that white area and the black area is preferred for urban use the way we look at it.

12:40 It's about 18.8 percent of the area, agriculture's about 10.2 percent, conservation is about 28.7 percent...

12:47 ...and then we deal with minor and major conflicts for a total of about 2 million 460-some thousand acres of land...

12:54 ...there, and it's, in that total area. And so what happens is, they began to look at these, these ideas.

13:02 And we always deal with a trend, 'cause there are no perfect plans. There's no such thing as a perfect plan.

13:08 If you don't have something to compare it to, so we start off with a trend and we compare everything we do to...

13:12 ...that trend to try and figure out what it is we've got.

13:15 And if you look here, the description of the trend says most development occurs in suburbs farther from traditional centers.

13:21 Most housing is single story, single family. They're on one-third to one-half acre lots.

13:26 There are a few bike paths and no leafy walking trails - well, no walking trails.

13:30 People drive to jobs, schools, doctors, stores, and strip malls. We do strip malls really well.

13:36 The very young and very old have to depend on people to get them around. There are limited bus services...

13:40 ...commuter run miles in this scenario was 43 miles from DeLand to Kissimmee.

13:46 There was about 344 square miles of conservation areas that would have been lost - sensitive wildlife areas...

13:54 ...about the size of Manhattan. We would... The area would increase about 1.7 times to the size of Rhode Island, okay.

14:06 And it would double if the land area urbanized that started in 1565 with the Native American Indians, all the way to 2005.

14:14 And I don't want to spend a lot of time on this, but the economic growth in the area doubled to about \$421 billion...

14:21 ...and it would employ roughly 3,768,000 people.

14:28 So that was the, some of the economic analysis, and that's the trend.

14:31 Now the yellow up here, that yellow, that gray is the existing, the yellow is all the new urban development.

14:37 And you can see that the people are really going to do this. Now once you do that, you start to ask people questions.

14:44 Is this what you want? And virtually everybody, including even real estate people, do not really want to see that.

14:51 They really don't want sprawl. They want some other way to deal with what's going on.

14:56 And so what happens is, we brought in 3,000 people, we had two visioning games, they put down 65,000 dots...

15:03 ...of where they thought the density ought to go, and we integrated that to try and come up with these places where...

15:07 ...density could be. Now you can game this.

15:10 There's no doubt about it, and as I think Doug would tell you and Carl will tell you, it's easy to game the system...

15:14 ...and in fact, you can see that the people that were interested in what was going on down there in, in Destiny...

15:21 ...were gaming the system. So because you bring the general public in doesn't mean it's the absolute correct...

15:27 There is no absolute correct answer.

15:29 On the other hand, if you bring the people in and you get people involved, and we had this, by the time we were done...

15:35 ...it was presented on the regional TV for about four hours. There were, there were general public voting on this kind of thing...

15:42 ...for the particular scenarios that they enjoyed.

15:46 So the three scenarios were green area scenario, a center scenario that was pretty much cities, towns, and villages...

15:52 ...connected by basic rail, okay. And then there was this corridor idea, which was intense light rail, street cars, commuter rail...

16:00 ...representations, and that.

16:01 And these were just visions of what they would like to see or what they thought they might be interested in.

16:07 The green area scenario turns out that instead of developing the way it would, the region turned out to have...

16:14 ...39 percent urban and 51 percent conservation, with 10 percent undeveloped, which was a significant saving.

16:22 There was 2,483 square miles of proposed new conservation lands, and an addition of 4,627 square miles...

16:30 ...of conservation land equaling one-half the size of the state of Vermont.

16:35 They really, they really began to want that. This is just the green area scenario. It didn't win, by the way.

16:40 The wildlife routes are preserved. There's greenbelts. There's connectivity.

16:44 You can see that the connectivity in the dark areas are the existing conservation, the light greens are...

16:50 ...the corridors, okay. The gray, again, is the same urbanized area.

16:55 It turns out that the air quality didn't get a whole lot better in any one of these scenarios.

17:01 In fact, it got worse than 2005. Water consumption was 8 percent less than the trend.

17:06 As a result of the increased density in urban areas, there were 200,000 more jobs than the trend, and the economic...

17:13 ...value was \$448 billion worth of gross regional product, which is 6 percent, 6 1/2 percent larger than...

17:20 ...trend, and there were 3,966,000 employees, or employment.

17:26 And the urban areas began to look like that. The...they became denser, obviously.

17:32 So we did the same thing with the center scenario. And the center scenarios, they began to work with this idea of...

17:37 ...where would they want centers? And as you can see, Destiny didn't win out as one of the centers, but the...

17:43 ...other places began to say, We would really like to be urbanized areas.

17:47 And when we looked at this, the development, it got, got denser. It grew vertically as well.

17:53 In the Garden Cities areas, there are greenbelt conservation, 4,198 square miles, or 47 percent of the region was still in greenways.

18:04 Air quality was 17 1/2 percent better, and the water consumption was 8 percent less.

18:09 So it didn't change the water consumption much.

18:11 People were...you had biking, you had transit opportunities and those kinds of things.

18:16 The total employment was 4,123,000 people, which is 355 thousand more.

18:23 And the gross domestic product was \$460 billion.

18:29 Now I'm doing this rapidly, I understand that, but that's what happens in 35-minute presentations.

18:34 And the center areas looked like this, in terms of their densities.

18:38 So then they went and said, okay, let's look at the corridors.

18:41 And the corridors turned out to have a massive amount of transit, which wasn't realistic...

18:46 ...but the...the 226 people wanted to see what that will look like. So transit is the transportation backbone of the region in this scenario.

18:56 Cities are encouraged to create taller, one-third mile of transit stops - taller development within one-third miles of transit stops.

19:04 Many vacant strip centers became new, new town centers.

19:08 There is a 413-mile system of commuter rails, light rails, and that. That's an incredible amount, you know, of rail, to say the least.

19:16 The average person spends 1.3 hours per day in the car, which is less than what was going on

at 1.5 hours per...

19:23 ...day in the car with, with the trend.

19:26 Residential side streets generally remain intact.

19:29 The buildings were taller, the neighborhoods looked and are similar to the centers but were more like a...

19:33 So this is sort of their idea at the time of a really mass-transit TOD operation.

19:39 Because the urban footprint is denser along the rail lines, the amount of urban land consumed from 2005 to 2050...

19:45 ...is just 660 square miles. It's not in the thousands. We cut it into basically someplace in the range of about a third.

19:56 The region is 36 percent urban. Total conservation land is 3,816 square miles, and there's 42 percent of the region.

20:03 Twenty-one percent of the region remains undeveloped. Air quality is 9 percent better. Water is, is 9 percent less. Consumption is 9...

20:11 The economy is stimulated by the ease of moving people. More affordable housing choices are in the mix of land uses.

20:18 The gross domestic product is \$513 billion, 22 percent more than the trend, and there are 4,225,000 employees...

20:30 ...employment for the same number of people.

20:35 The urban centers, clearly you can see, and that's Orlando in the center right there, that's Orlando in the center.

20:41 Well, it turns out that they then went back and they started to look at the results.

20:45 And what they found out was - and this blue, this light blue here, is always going to be the trend...

20:49 They calculated some acres wrong so I hid them, so I covered up their mistake.

20:54 So what happens is, you have a population of 3,500,000 to start with.

20:58 You end up with 7,123,000 people in the region when you get done.

21:03 The developed, or committed urban lands, it...in, existing is 2,600 acres, the trend is 5,000 acres...

21:12 ...the green area is 3,500 acres; the centers is 3,400 acres; and the corridors, 3,200 acres.

21:20 Again, you can see along the way, in terms of the number of persons per acre, is 2.15, at this time,...

21:27 ...and it increases from 2.15 to 3.15 to 3.22 to 3.44.

21:32 Not a huge amount of, of people per acre in gross urban density.

21:39 The environmental indicators, it turns out again that conservation lands, there was 2,144.

21:45 The trend didn't add any existing conservation lands.

21:48 And by the way, the State of Florida has just stopped its land purchase at this particular time because of the economy.

21:53 So they really aren't buying lands now.

21:56 The green acres has 4,600, the centers has 4,200, and the corridors has 3,800, so it has less conservation lands.

22:05 Again, if you look at what's going on in terms of threatened and endangered species habitat areas, there was 394.

22:11 That's an additional 344 square miles. Instead it went to 44, 45, and 28.

22:19 We didn't...by the way we developed, the pattern that we chose to help them develop with, and the pattern they chose...

22:24 ...that we helped implement, or model, reduced the loss of endangered species, biodiversity...

22:31 ...habitat that supported endangered species, wetlands, any number of other things.

22:35 I think it was Doug the other day, said about wetlands, it turns out, why would a farmer drain a wetland?

22:42 Well, in Florida, it's not necessarily a farmer. We've got lands that are called agricultural lands not zoned for agriculture.

22:50 Interesting title, right? What does that mean?

22:52 That means that as an agriculture person, I can declare it a wetland, then I can develop it, okay.

22:58 So you can't develop, you can't clear wetlands in Florida to do development, but you can clear wetlands in Florida...

23:04 ...for agricultural use.

23:05 And so what happens is, there's now a code in the property parcel dataset that says, "agricultural lands not zoned for agriculture."

23:11 Or if you want to leave your lands in agriculture and collect an agricultural exemption, okay, there's a place...

23:19 ...in this area and it's called The Villages. It's an incredibly interesting place for retirement.

23:24 Everybody's driving around with their Gator flags and their Auburn flags and their Harvard flags.

23:28 I don't think they do Harvard flags, okay. But what happens is, they're driving around in their

golf carts with...

23:32 ...these flags and everything else, and they're golfing and doing all this stuff, and they're...they got the biggest real estate program...

23:38 ...in the nation, and they bring people in and they're developing.

23:41 A man owns 24 square miles down there and he's got a couple of the square miles down there with a buffalo on...

23:47 ...each of the square miles and he gets an agricultural exemption, okay, to defer the costs.

23:54 Transportation indicators, okay. The one I think that's interesting here, you...I'll be glad to go over this...

24:02 ...but I think it's more important to look at the cost of what adding that new, all those new rail in, okay.

24:08 The trend, no out of beltway and with some 43 miles of that is \$22 billion worth of...

24:15 ...and this, you'll notice, I think this is the 2000, this is 2060, or 2050, there's \$22 billion worth of development.

24:24 In the green areas, there's \$34 billion worth of development for the new roads, okay and the...

24:30 ...new transit opportunities, or the new transit. The centers has 44 billion, and the corridors has 44 billion.

24:39 So in other words, that big jump in the economic indicators that we're talking about, okay, didn't all...

24:44 ...occur because they were building rail.

24:47 So there were new jobs that were created that were permanent jobs, not jobs created to just generate rail...

24:52 ...but there was a significant amount of economic opportunity that occurred in building the rail.

24:57 And then clearly, there is a private-sector investment that goes all along rail that's unbelievable.

25:02 In fact, all you have to do is look at Portland, Oregon, and they've got a couple billion dollars' worth of...

25:07 ...private-sector investment along their rail areas. Again, some indicators. The average speed...

25:15 You notice, the trend is, is basically 33 miles per hour, the, or I mean, today it's 33. The trend is 21, 21, 25, and 23.

25:27 It doesn't change that much, 'cause urban area...the most amazing places in the world - New York, Paris, San Francisco,...

25:35 ...Boston - they're congested because they're cities. Cities are congested.

25:41 Some of the most creative places are congested.

25:43 The solution, in my opinion, and here's the academic in me, is not to go try to figure out how to do new roads...

25:48 ...but let's get some mass transit into here. And you're still not going to decrease the congestion...

25:53 ...'cause cities are going to be congested. It's, it's the, it's the, the way that cities work. That doesn't mean they have to be bad, okay.

26:01 That doesn't mean you can't get to where you work faster or those kinds of things.

26:06 It depends on your mode choice for how you want to get there. The economic and water indicators, okay...

26:13 ...17 hundred million gallons a day on the trend, 1,500 and 70 million gallons a day for the green acres...

26:20 ...1,560 and 1,550. The water consumption doesn't change that much. That's going to require other kinds of technology.

26:26 It doesn't change based on the land uses as much.

26:31 So population projections. This was really interesting because it, it started a general discussion that some...

26:36 ...people would actually be better doing the sprawl than they would be in doing the other alternatives.

26:41 And so what happens, if you look at Brevard County under the...the BEBR moderate projections by 2050...

26:47 ...they would have 932,000 people. The green acres was 914. The centers would be 958. They would go up...

26:54 ...because they have an attraction of more. The corridors would be 967, and the trend would be 888.

27:00 They wouldn't actually get as much in the trend. They would begin to attract because of the centers.

27:04 A tract development attracts some people, attract job opportunities, and attract other activities based on the fact...

27:11 ...that they were developing in some center particular strategy. So how does LUCIS work? Now I showed you what it is.

27:19 We won a national award for best, best use of technology by a university. And My Region won best use of technology...

27:25 ...by a regional planning, planning organization from the APA for that project.

27:31 And so, LUCIS really is not...it's...and Peggy...Peggy is an incredibly interesting person.

27:39 I wanted to call it LUCAS, L-U-C-A-S, for land-use conflict analysis strategy.

27:44 Peggy wanted to call it land-use conflict identification strategy. You know who wins in these discussions, okay?

27:50 I've been married 40 years, I'm well trained, okay. I tease my students, I'm a magic wallet. Money shows up in it.

27:57 I have...my wife's an accountant. I have absolutely no idea where, where any of our investments are or anything like that, you know.

28:04 I'm the reverse. If she dies, I don't know where to go. There's a, there's a safe, and I'm supposed to go in there and do something, okay.

28:10 So the LUCIS project, we...we start by developing goals, objectives, and subobjectives, and we model those.

28:16 We model suitability reflecting those goals, objectives and subobjectives.

28:20 We create preference from suitability, and I'll show you how to do that.

28:22 We either normalize or transform that preference into a way that we can...we collapse it into categories of high,...

28:29 ...medium, and low, and then we use those collapsed preferences to help us identify land-use conflict and land-use alternatives...

28:35 ...or land-use opportunities, as well. So here's just some example, okay.

28:42 So with a, a subobjective, three goals. We have these three major goals. For greenfield development...

28:48 ...we look at agriculture, we look at conservation, we look at urban.

28:52 Depending upon where we're at, conservation might actually be titled ecological significance...

28:56 ...'cause people do not like to hear the word conservation. I'm not exactly sure why.

29:01 They just don't like to, to have it that way. So rather than argue about a miniscule point, we change it.

29:06 But I work with doctoral students, and so you'll notice that that process is in alphabetic order...

29:12 ...agriculture, conservation, and urban. That way they can't forget it.

29:16 Okay, so when we're dealing with these numbers, the reality is, keep it the KIS method, keep it simple.

29:23 And so we model things like multifamily use, we model single-family use. We model commercial, retail,...

29:29 ...service, industrial, institutional, entertainment. That's just in the urban area.

29:34 We model biodiversity, species biodiversity, habitat biodiversity, surface water, underground water.

29:40 We model connectivity, habitat connectivity. In agriculture, we look at the various different forms of agriculture...

29:47 ...including the orchards, including high intensity like cattle and pigs, chickens.

29:55 We model low intensity. The horses, the horse farms that we have and those kinds of things like that.

29:59 We model each and every one of those. There's 500 different models, I think, in this.

30:04 And by the way, it's not...it's going to be easier to use than it actually is right now.

30:09 Like problem with working with doctoral students, okay. The suitability for the goals, then, and that's - there's one of our models.

30:16 I like, I like our...we decided to have our models go from bottom to top, 'cause everybody else's goes from left to right, okay.

30:23 And I'm at a university and I can't figure out how to go from the left to the right. It just never, I don't do that very well.

30:29 So what I...that must have missed everybody, okay, yeah. I don't go conservative, okay, so.

30:35 So what happens is, we model this. And this is the noise for single family.

30:39 And when...what you look at is, we're looking at airports, the regional parcels. What kind of parcels might generate noise?

30:44 Active rail, interstates, major roads, power plants, water treatment facilities, sewer treatment facilities.

30:51 This is a deterministic model. This is not a stochastic model.

30:55 I don't know how many times I've gone into a land-use meeting and I've said, in fact, I will do it right here.

31:01 How many of you would like to live next to a prison? Oh, my God.

31:04 How many of you would like to live next to a prison? How many would like to live next to a sewage treatment plant?

31:11 Right? You run a stochastic model, those are going to come up not significant.

31:15 Nobody in here except Carl said he would like to live next to a prison, okay.

31:18 I would suggest that's a significant variable, and the way to deal with it is, is these deterministic models.

31:24 So now I'm going to have to go real fast, 'cause I have five minutes.

31:26 That's what that model looks like, and it turns out that up in Seminole County, there's a lot more noise.

31:32 So we look at the standard stuff. Oops.

31:34 We look at the standard stuff - hazards, air quality, floods - to do the physical, and we weight those...

31:39 ...okay, and so weighted suitability model. We do the same thing for prisons, entertainment, water and sewer facilities, okay.

31:46 Existing single family, retail, environmental amenities; and this is a single-family model that I'm dealing with.

31:53 Major roadways and services, and we weight those. And then we look at the existing land uses.

31:59 What land use is good for single-family residential? In Florida, agriculture. But some agriculture isn't.

32:05 If you're raising palm trees, that's a very, very valuable land...

32:09 ...especially if you're putting those palm trees as part of the landscaping for the various single-family residential...

32:15 ...properties that are current.

32:16 We model the density and we look at three, three decades of density. We model a historic growth over a three-decade period of time.

32:24 And then we take this, the physical, the proximal, the existing land uses, the density, and the growth history...

32:30 ...and we turn that into an existing category.

32:34 Next, we take the stakeholders and we ask them to help us.

32:37 And then they, they help us determine what's important among those categories.

32:41 This is those people in the, in communities. This isn't experts.

32:44 This is the 3,000 people, or the people who are beginning to work on, on...that you're beginning to work with.

32:49 And when we're done with that, if this goes forward, you get an urban category.

32:54 Now we have urban, we have agriculture, and we have conservation.

32:59 We also have single-family residential, multifamily residential, we have all those available.

33:04 And so what happens now is, we can collapse those. And one way to collapse those is you can just do these natural breaks.

33:09 You can collapse what you've got in that raster...raster and vector.

33:13 You can use natural breaks, you can use manual method, you can use equal intervals.

33:17 I've become a proponent of equal intervals. I used to be a proponent of standard deviation...

33:21 ...but I've become a huge proponent of the equal intervals. It keep everything in the same scale much better.

33:27 When you get done with it, you take this kind of a thing and you begin to drop it into three categories...

33:31 ...where the green is high preference, the yellow is low preference, and the red is, or I mean the yellow is...

33:37 ...moderate preference and the red is low preference.

33:39 And so that's what a natural break looks like.

33:41 And you can see between those three, just trying to give you this idea, it does matter how you do it.

33:48 The next part of this is, we identify the conflict. And this is the very...this is simple. It requires math.

33:54 Anything you do with rasters requires some kind of math.

33:57 So we take the ag categories of "three-two-one" and multiply them times 100. This is graduate-level PhD math, okay.

34:05 You take the three-two-one, you multiply it by a hundred. For the...for the conservation, okay, it's ACU.

34:11 You take the three-two-one; you multiply it by 10; and the urban, you leave it alone.

34:15 Now you add them all together and you end up with numbers that look like three-three-three.

34:19 That's a high preference on all three of those categories. That's conflict, okay.

34:24 Where you get a three-two-one, you have a high agricultural preference, a moderate conservation preference...

34:27 ...and a low urban preference, okay. Probably not going to develop really quickly. So you end up with 27 categories.

34:35 I'm not going to go through all of them, okay, but what happens is, you can see that that gives you a really, really...

34:40 ...flexible way to look at things on very incrementally small areas.

34:45 The next one is, you try to keep it in the same category.

34:48 So now you're looking at commercial, multifamily, and retail for mixed-use opportunity, and you can do exactly the same thing.

34:55 So now, inside of urban areas, we can begin to look at what we've got for mixed-use

opportunities...

35:01 ...using exactly the same thing. And I love the one-one-ones. Everybody goes, Why the one-one-ones?

35:13 Three-three-three is a high preference. If I'm looking for mixed use, that three-three-three is a really good place.

35:21 So one of the things we do next is, we start to do scenario development.

35:25 And our scenario development turns around and says, let's look at a mixed use redevelopment.

35:29 And we...the students love these ideas. Well, it turns out, I guess, the dashboards are these spreadsheets, too.

35:36 And so what happens now is, we create spreadsheets.

35:38 And we'll do something like use census blocks and transportation analysis zones 'cause the person who was from...

35:43 ...California the other day got up and did this presentation and said, "I have to know stuff in these really little areas."

35:48 Well, we have to be able to summarize it back up. So all this locational stuff helps us summarize it back up.

35:54 The next thing we do is, we add in that conflict. Right over here is the conflict. And we add in the, the suitability levels.

36:01 And after the suitability levels, we can add in the acres that we're working with and the actual parcel acres.

36:06 We have parcel IDs, so we can flip back and forth between the actual vector datasets as well as the raster datasets.

36:13 And from there, we use this, this allocation by year and population. We can allocate employment, we can allocate population...

36:19 ...we can do it by year. We have gross urban densities and those kinds of things. So we jump into this spreadsheet.

36:25 And that spreadsheet's pretty interesting, 'cause it's got 5.5 million records.

36:29 So you've got some real interesting suitability out there, and you've got it at small scale.

36:35 And I've got a feeling I'm about ready to go off, so. Here's the redevelopment mask. I'm going to go up for one more minute.

36:41 I'm just - I'm going to pull a Carl. Stop. Okay, so.

36:44 And what happens is, now I can look inside the redevelopment areas for the mixed use.

36:48 And that right there is redevelopment commercial. This is redevelopment retail. That's redevelopment multifamily.

36:58 You put them all together and I want you to look, oops. I want you to look at this area right in here, okay.

37:05 The redevelopment retail, the multifamily, and right here you can see there's those points.

37:11 It automatically comes along and tells you where, where your mixed-use opportunities are best. We've put it together with greenfield.

37:20 That's what the trend looked like with the 7.1 million. This is a composite. They...they couldn't do the, the rail...all that rail.

37:27 So they asked us to put together the composite. We put it together the way I just described.

37:32 We did the next one, and it turns out we put seven million people on one quarter the area.

37:37 We saved the entire ecological plan, and we never even really did the...had to run into conflict with any of the ecological areas.

37:46 Now if you go to a land-use meeting, you walk into that meeting, and that large developer has that...

37:50 ...land out there and you go, "We just saved all that development on the land you want to develop,"...

37:54 ...they're not necessarily happy. Do you want me to quit?

37:58 [Inaudible]

38:00 Okay. This is a very interesting mix. We can take that and try to figure out, what, what would be the mix when you did it?

38:07 So this idea of, of, if you believe in suitability, we have commercial, retail, and multifamily, we can come up...

38:13 ...with what a commercial mix looks like. Look at this area, this area, and this area. That's the commercial percentage.

38:20 That's the retail percentage, and that's the multifamily percentage. So watch this right here.

38:26 That's...that's multifamily. Not really good for retail, but really good for commercial.

38:32 There's commercial office place and mixed-use residential opportunity in that whole entire area right there.

38:37 And we know what percentages that, that development might, might look at.

38:45 This is a new way of doing a proximity. Those are all the multifamily units in the, the area. That's all the commercial opportunity.

38:55 There's all the transit centers on the rail, or I mean, not on the rail, on the bus routes, okay.

39:01 And we now look at walkability to those areas and then we do network analysis to come up with network...

39:07 ...accessibility from multi - all the multifamily units to all the commercial activity. That's built into the model.

39:15 And so, lessons learned, and this is where I'll stop for you.

39:19 Regional urban form can be determined using GIS. It really is a matter of using technology.

39:28 Regional geodesign models can produce results that are summarized to local areas, making geodesign proactive,...

39:34 ...flexible, and community based, and I took that directly from your work.

39:38 Existing land-use plans can be compared to multiple regional geodesign scenarios and assist decision makers.

39:46 Regional geodesign allows the development of policy alternatives that do not restrict design creativity.

39:52 I'm going to say something affectionately here about architects because I'm an associate dean in a program that...

39:57 ...has a lot of architects, but landscape architects and almost all designers, you're out there all the same.

40:04 Most of those schools are called schools of architecture, okay. So that's SOA, okay.

40:09 Well anybody ever watch the program Sons of Anarchy? If you've ever been in on an architecture faculty meeting, it, it...

40:17 ...you're not going to go to a designer and say, "Here. Here's a form base. I want it to look this way." It's not going to happen.

40:24 You have to allow them the creativity to practice their profession, but you have to have some kind of regional context...

40:29 ...that guides that. This process, I think, we're...hopefully, this process is useful in that particular method.

40:36 Planners and urban designers can analyze and identify important regional parameters and still allow designers...

40:41 ...the freedom to create exciting urban spaces, and regional geodesign has the potential to change our antiquated...

40:51 ...disjointed incremental development policies. And if we do that, we've done a really big thing in just geodesign as it is. Thank you.