

Keynote Speaker Richard Saul Wurman

Richard Saul Wurman, founder of TED, talks about the 19, 20, 21 vision. He is an author, architect, and urban planner. Wurman examines how cities organize themselves, finding patterns, and comparing them. Jon Kamen, Chairman and CEO of Radical Media gives several examples of different cities and their population density and land use patterns. He emphasizes the need for comparative analysis in order to be able to ask the right questions and manage change.

<http://video.esri.com/watch/49/keynote-speaker-richard-saul-wurman>

Video Transcription

00:01 [Applause]

00:12 Sometimes you change jobs because you get fired. Or you fail. So sometimes what it looks like, it didn't really happen.

00:24 You go from one thing to another because something went wrong, or you have a different curiosity or something.

00:34 I was just backstage and my name came up as the keynote speaker, and I had this flash memory of...

00:43 ...in junior high school we used to try to be cute by saying our names backwards.

00:50 And my name was backwards back there, namruw luas drahcir. I hadn't thought of that in so long.

01:02 And just doing those little skip memory of things is another path to learn from.

01:10 My earliest memory was the 1939 Worlds Fair. I was four years old.

01:22 And the symbol was the Trylon and Perisphere and I remember this amazing model of the city of the future.

01:32 And I was just smitten with that. I thought, Wow! And I really thought it all was going to happen.

01:41 I mean, I just...I get seduced into anything.

01:45 You know, somebody I was sitting with at lunch and they said nice things about me and I said...

01:49 ...you know, that they could seduce me into compliance.

02:01 Flattery will get you everywhere.

02:10 I studied architecture and I got my master's degree in architecture...

02:18 ...and I started teaching because my mentor, Louis Khan, said I should teach for a couple

years.

02:26 And so I went down to North Carolina and started teaching. And I was 26 so I was assistant professor of architecture.

02:33 And I was shocked. I was from Philly and I was shocked that people didn't understand where things were.

02:41 So I made up a project and I bought some white plasticine, kindergarten clay, the stuff that never hardens.

02:52 And I picked some cities and we made some models. And that's on your poster, those little models.

02:58 Those are 48 years old. And I had two surprises.

03:05 Halfway through, it took six weeks; three weeks for half of the cities and three weeks for the other half.

03:10 We divided it in half because I had to scrape the clay off the first ones to use them in the second batch, because I didn't have a penny.

03:18 And I was surprised that people liked the book. And I thought it had've been done oh, just many times before.

03:28 That of course you'd want to see what one city looked like next to another city.

03:33 You'd want to see things comparatively.

03:40 That hasn't left me for my whole life.

03:44 A kind of grammar, a kind of series of laws of how to understand things.

03:49 What I call Information Architecture.

03:51 And I invented that term when I was National Chairman of the AIA Convention in Philadelphia in '76...

03:58 ...and it was called the Architecture of Information.

04:01 And there is a grammar to information and visual representation.

04:06 Some information is nouns, and some of the information you put on top of it is verbs.

04:14 And we all understand grammar, but we have no grammar, no set of rules, for how we describe where everybody in the whole...

04:24 ...well, half of everybody, in the whole world, lives.

04:29 And that fascinates me.

04:30 I gave a little talk, a short one, sort of semi-impromptu, to this executive meeting yesterday.

04:39 And one of the things I said is that most people, and certainly there's a lot of most peoples in

this room...

04:50 ...most people sell their expertise. And that's the way society seems to move ahead.

04:56 In fact, that's the way all conversations take place, that you tell somebody about your expertise.

05:02 But when you have expertise you have a limited repertoire. You have expertise in a certain thing.

05:10 Well I sell my ignorance and I have an unlimited repertoire.

05:17 So it is the things that I don't understand that I sell.

05:23 And that's why, as Jack said, I move from subject area to subject area.

05:28 I've done these 80-some books and they're on about 60 subjects.

05:31 I've done them on sports, I've done six on medicine...

05:35 ...a couple on business, Wall Street Journal Guide to Money and Markets. 00:05:38

05:39 At the same time, they're all on one subject.

05:44 A passion to find a pattern. A passion to take the journey from not knowing to knowing.

05:54 See, I think that's the secret. It sounds very Zen-like. I'm not Zen. But think of that, and think if you're able to do that.

06:04 Can you put yourself in a place where you understand what it's like not to understand?

06:15 Can you blank yourself so that when you see something up there and somebody shows you some diagram or some flowchart...

06:24 ...or some map or something with 28 layers on it, you actually can say, I don't understand that thing at all!

06:30 And you're not ashamed.

06:35 We're all ashamed of showing our ignorance.

06:40 And I will tell you, you don't understand most of what you see.

06:44 You don't understand most of what you read well enough to tell a literate 12-year old. You just don't.

06:55 Well, you should applaud yourself if you can get there, because it is so fundamental to understanding.

07:01 And what business are we in, you can say it after me, we're in the understanding business.

07:08 We're in the understanding business.

07:12 We are trying to communicate some pattern to another human being or group of human

beings, and to ourselves.

07:22 It's not easy to actually have another person understand a semblance of what you understand.

07:32 And it's not by putting more on a surface, or more on a map, or using bigger words, or more footnotes...

07:40 ...or more references, or all the things that you show off trying to be smart.

07:45 We're all stupid! We, collectively, are stupid trying to get...finding patterns, finding something that warms us up...

07:54 ...that we can tell another person about and change the way they see things and to help them in the patterns that they make.

08:03 A map is a pattern made understandable.

08:08 And these maps shocked me in 1962 or whenever, of being able to see the relative size of one place next to another.

08:17 I had no idea. I didn't know that Angkor was as big as Paris.

08:26 Those who call it Angkor Wat are wrong, that's just one of the 72 temple complexes.

08:35 And any place you begin with learning ends up some other place.

08:42 Two days ago I was thinking well, what's the biggest geographic problem? I guess it's the whole earth.

08:48 And Jack talked about mapping the whole earth.

08:52 And I realized, when I started researching it, and this is just two days old that shocked me, that in 240 B.C. ...

09:04 ...somebody had written that their estimate that the circumference of the earth was the equivalent in today's terms of 25,000 miles...

09:14 ...that it was round and it was 25,000 miles.

09:18 And as everybody in here knows, it's 24,901 miles. Isn't that amazing?

09:27 That there were centuries that they then thought it was flat and you were killed or ostracized or worse for saying that it was round...

09:36 ...and yet somebody could estimate that it was round and approximately the size at 240 B.C.

09:48 Well, I'm always surprised by these stories. I'm surprised at how change happens.

09:55 At lunch I was sitting next to a gentlemen who was up on the stage earlier...

10:00 ...I was just saying, in 1848 when...I'm forgetting his name...died...the richest person...

10:11 Oh, Jon Jacob Astor. He died, and he was the richest person on earth and he made his money from selling beaver pelts.

10:20 And then when the Vanderbilts died, they were the richest people on earth, they made it from railroads.

10:26 And then we just had a great speech by a gentleman from Mexico...

10:31 ...and there were more millionaires in the world living in the Yucatán and Campeche...

10:37 two of the three states in that bump in Mexico.

10:40 Now that bump in Mexico, everybody calls that whole bump the Yucatán.

10:44 You know it isn't the Yucatán, it's three states...

10:48 ...and one of those states, the Quintana Roo, didn't become a state until 1915 and was lawless until 1931.

10:55 But in Campeche and in the Yucatán, they grew rope.

11:01 And rope was ubiquitous in the world because there was no corrugated cardboard or wire or anything...

11:06 ...and the industrial revolution made shipping things from around the world absolutely important, raw goods, manufactured goods.

11:16 So the wealthiest people on earth lived in that area.

11:21 These are the patterns of change that you can map, you can make clear, you can tell a story...

11:27 ...but you can be ready for the next change, because change will occur.

11:32 Everything you think is a pattern now will change.

11:37 So here we are, most people live in cities and so we want to collect information on those cities.

11:47 That little beautiful, beautiful film that Jon Kamen and his staff did, kept on asking the question, How?

11:56 And isn't it ultimately always about a question? How many people live here? How does this work? How does this happen?

12:03 How does crime happen? How do we learn? How do we do everything?

12:08 Well, most of us can't ask a good question.

12:11 Most of our questions aren't even good and we never take a course in how to ask a question.

12:16 And yet, it's the question that gets us the answer.

12:20 So if we ask questions about what makes up a city and we want to display it, don't we have to have a border to that city?

12:31 Do we all recognize the fact that there is no methodology for putting a border around a city?

12:39 There are political borders, but there are no borders around the cities...

12:44 ...and every city of any size has gone over the edge of the political boundaries.

12:49 Therefore, any question we ask and any information we map becomes trivial...

12:55 ...because we don't know the area within which we're mapping it.

12:58 So we can't get any density. We can't show things comparatively.

13:03 We don't have a language. We're all speaking a different language.

13:07 We all understand numbers, but we don't understand, in a collective way, the base of maps that has to do with questions...

13:14 ...that has to do with answers, that has to do with a system of displaying information. And that fascinates me.

13:23 I'm trying to do the same thing with health. And Jack said I'm running a health care conference.

13:29 I'm trying to make the questions you ask be able to be answered in a way that's comparative so you can understand about yourself and others.

13:38 It's the simplest, dumbest, dumbest thing that I can think of is what attracts me.

13:45 You know, there's a comedian that does one liners, Steve Wright, and he says...

13:50 ..."Everything is in walking distance if you have enough time."

13:56 Is there a person in this room who hasn't asked of somebody, "Is it in walking distance?"

14:02 Do you realize what a stupid question that is? What is walking distance?

14:09 It depends on the weather, the heat, how far you want to walk, how dangerous it is, how comfortable it is, how interesting it is.

14:19 It's not a good question.

14:23 So think about the questions you're asking of these incredible maps that all of you are producing, all this information.

14:33 There is not an information overload.

14:36 There is an overload of non-information, of data that's not put in a form that we can understand.

14:45 Understanding precedes action.

14:56 When I tell people I'm kind of interested in cities and they say, oh, good, you're going to make the cities better.

15:02 No, I'm not going to make cities better. I don't have an idea of how to make cities better.

15:08 I'm not working on making cities better, or schools better, or less crime.

15:13 I'm working on just understanding the phenomena of cities.

15:17 Because until we understand them, we can't take action.

15:26 I am known to talk for a very long time.

15:28 I might get up and talk a little bit more about some things...

15:30 ...but we're going to move it on and I'll have another chance to get back at us.

15:34 Jon, are you around?

15:35 Oh no, first we're going to have Hugh Keegan who we've worked with at Esri...

15:40 ...and show a couple demos over the old work, okay? Hugh.

15:45 You want to come over here and stand next to me?

15:46 Oh yeah, I'll do that.

15:48 So this is kind of an homage to the posters, the models that Richard and his students made back in '62.

15:56 In 1980 when I was a graduate student, I actually found these in the Loeb Library in the stacks.

16:01 They came in a little 6" x 6", 8" x 8" box.

16:05 It was a fat thing, and I remember opening the box and spreading these photographs on the floor...

16:12 ...and I was stunned by the very same thing that Saul is still trying to communicate.

16:16 It's like, Wow! Look at London compared to...pick a different place.

16:21 It was just...it gave me goose bumps, it gives me goose bumps still.

16:25 So what we did was, we just put together a little application where we took some of these maps...

16:30 ...we published them as services, and we've put them behind current, contemporary satellite imagery.

16:39 And you've got to remember, '62, no digital elevation models, no commercial satellite imagery.

16:46 You know, okay, they were working from maps, but these are clay models.

16:52 And we georeferenced these some, but you get some idea of just how great these things actually are.

16:58 Your students did a terrific job.

17:00 It's like finding a kid that you never knew you had.

17:05 Which might happen!

[17:11](#) Son!

[17:21](#) Anyway, this is, we put this together, we thought this was just so, so cool.

[17:27](#) We'll probably get this out on an Esri Web site someplace.

[17:31](#) But this is imagery contributed by our partners and our users...

[17:38](#) ...and you can just see what a great job these students did such a long time ago.

[17:42](#) But it's just cool to compare these side by side, don't you think?

[17:46](#) Is it just me? Okay.

[17:51](#) It was 20 students, for six weeks, and it wasn't a project they were doing for class. It was just after hours.

[17:57](#) I've got to tell you, when I was in the library I was thinking, man, maybe I should have gone to North Carolina.

[18:02](#) And then I thought you know, I'm actually learning GIS, maybe I'll stay here. Maybe this is time to bring on Jon.

[18:08](#) Okay. Jon Kamen.

[18:19](#) Jon is the founder and the owner of Radical Media, and a friend of mine.

[18:25](#) And the third partner, Jack, and Jon, and myself, in 19, 20, 21, it's a very simple little partnership.

[18:32](#) We each own a third, and we're just struggling to try to make an idea understandable.

[18:38](#) And well, we've known each other for a couple years and look at this in the good way...

[18:48](#) ...it seems like we've known each other forever.

[18:51](#) But the positive side of that, it seems like we've known each other for a long, long time...

[18:56](#) ...and I enjoy his company so very much. Jon, why don't you show us something?

[19:01](#) Thank you.

[19:02](#) So I have known Richard a very long time. He just didn't recognize me until many years later.

[19:09](#) Of course, the TED Conference, for any of you who may have attended it or any of you who might see it online...

[19:17](#) ...was a very inspiring experience for a young man learning and wanting to learn more about...

[19:24](#) ...in many cases, as Richard will admit, his curiosities.

[19:29](#) And post-TED, we were in touch and talked about perhaps doing a project together and thinking about different things.

19:40 And my company does all sorts of different types of projects.

19:43 We produce documentaries, we produce television shows...

19:46 ...we produce work in the advertising world as well as digital platforms and all sorts of interesting design projects.

19:54 And Richard called me at Radical Media and he said, "Jon, I have a new idea." "What's that, Richard?"

20:02 He said, "19, 20, 21." I said, "What's that?"

20:10 He said, "19 cities in the world that are going to have a population of over 20 million people in the 21st century."

20:24 I said, "Really?" He said, "Well, not yet but there will be."

20:29 And in fact, our journey began.

20:31 We started thinking about this project, what it could be, how we could manifest it in terms of multiple platforms...

20:43 ...thinking of it in terms of television, in terms of an online presence, having some technology that was built into it...

20:52 ...which we were very fortunate along the way to meet Jack Dangermond and the wonderful folks at Esri...

20:59 ...and we started working on this project.

21:03 But Richard insisted on one thing. He insisted that the very foundation of the initial work was based on maps.

21:15 I really didn't know that much about your world, but I do know that Richard has always been a huge fan...

21:22 ...and sits in his fabulous office with this fantastic map, and I knew that maps were a very important part of his life...

21:30 ...and his concept of information architecture.

21:34 And we started talking about the project a little further and what we thought we might be able to do.

21:39 And we started going out to see different companies that might be able to support a very lofty project like this.

21:48 And I remember going out, and we had this one simple saying that...

21:53 ...not only would mass urbanization be a defining mega trend of the 21st century, but more importantly...

22:03 ...in Richard's simple terms, no two cities measured themselves the same way.

22:10 And people would look at us incredulously. They didn't believe that that's possible.

22:16 And we said no, if you look at an atlas, if you look at a map...

22:20 In fact, the last time it was done, really, with the same scale, was practically in 1962 with Richard's clay models.

22:29 And we said well, hang on a second, that's not possible.

22:31 And we started to visit a couple of companies and in fact...

22:34 ...one of them asked us to do a little bit of a proof of concept, really look into this concept.

22:43 And so we went, and IBM commissioned us to work on this first phase of this project, which was help us define a city.

22:55 What is a city? And ultimately...and how do we define it? Where does a city center? Where does a city end?

23:09 And ultimately, how do you determine its edge? Because cities have grown tremendously.

23:18 As Richard described before, and as we've heard in so many of the earlier presentations today...

23:25 ...and in many ways we've become a planet of cities.

23:28 You don't travel from one country to another country, you normally will actually...your destination is a city.

23:36 So after having this epiphany of this missing component, we were setting out on our way...

23:44 ...and we commissioned the good folks at NatGeo to produce a set of mini maps for us.

23:51 And these mini maps were set all to the same scale, 50 square miles, 80 kilometers.

23:58 The highlighted area being the general population, not density, but the area of population...

24:06 ...and we started to see, just as Richard predicted, a pattern began to form.

24:13 And that pattern started to show us some very unique and interesting things.

24:17 We learned something, and my team at Radical has been so fantastic in terms of really becoming students of this technology...

24:26 ...and understanding, and the concept of understanding.

24:29 We learned that there were cultural influences that affected a city.

24:34 Take Beijing on the top left, the feng shui of the city forced the development of it going to the lower right.

24:42 And if you look toward Los Angeles, you'll see that infamous mountain range where the Hollywood sign that defines the city...

24:50 If we look a little further at another set of cities, you see certain patterns.

24:55 Calcutta is an urban sprawl today.

24:58 There is nothing that's holding in the city and its development.

25:02 And yet, if you take a closer look at Mumbai or London, Mumbai has a density six times that of London, but all on that one island.

25:13 And London has a manmade agricultural greenbelt that defines the city and doesn't allow it to grow beyond its existing pattern.

25:27 If you look a little further at two other cities that we know quite well, Tokyo and Mexico City.

25:34 Typically we think of them as the same population, about 35 million each. But it's a little strange.

25:41 Again, Mexico City is a landlocked city, essentially within the frame of a dry lake bed of the valley...

25:52 ...and Tokyo, once again, a port city but with the mountains that help define it.

25:58 Now the truth is that the measurement is a little elusive because when people say 35 million, what are they talking about?

26:06 There are six different ways in which you can legitimately measure Tokyo.

26:14 There's top left, the central Tokyo of 23 special wards.

26:21 The bottom right, the national capital region, which actually has a population of about 42.8 million people...

26:29 ...and is a big difference than the 35 million that we normally would refer to.

26:35 And of course, if you were thinking of understanding any other cities, you need some standard measure of comparative analysis.

26:46 I'll never forget when Jack Dangermond came to visit us and explained the importance of this project.

26:53 Something that we thought we were beginning to understand...

26:58 ...but Jack just looked at me very simply and said those two words, comparative analysis.

27:03 We have to have a standard and a means of measuring to be able to understand.

27:10 So let's take New York for a second as part of this study.

27:15 We're in New York, Esri has quite a few people that work closely with the city.

27:20 There was a lot of data that was available for us to be able to work with, and we started to dig a little deeper.

27:26 Now, most people think of New York as the greater metropolitan area. Kind of what you see

here.

27:32 But when you suddenly see it with this frame of 50 square miles or 80 kilometers...

27:38 ...you start to see and recognize that New York has clearly grown well beyond the geopolitical boundaries of New York.

27:48 In fact, we commissioned the folks at MDA Federal to provide us with some concrete density maps over a 25-year period...

27:57 ...and we got to see a fantastic view of the ever-expanding metropolis that we call New York City.

28:05 But it's clearly a lot more than, let's say, the mayor of New York has to deal with in the five boroughs that he governs.

28:15 And if you were a mayor of any city, especially in today's modern world...

28:20 ...you have to think of governing not only the people who live in your city, but you have to start looking at the very critical other factors...

28:30 ...the transportation basin of the people who commute into your city...

28:34 ...and the population change that takes place every day in that city because of this basin.

28:39 This one, indicating the commuter rails and sort of the average convenient roadways into the city.

28:45 The next measure would be a governmental measure of the MSA, or the 23 cooperating counties if there were to be some major event...

28:56 ...in which politically the different counties would have to cooperate with each other, there's this map.

29:02 Then of course there's another form of interpretation of concrete density, and you can even look at it as city lights...

29:09 ...which is remarkably similar to the concrete density map.

29:13 And you combine all of that in a compilation, which is almost an algorithm for creating a standard measure.

29:23 Maybe not unlike the Richter scale or the Fujita scale. I wanted to call it the Wurman scale.

29:29 He said no, we'll call it 19, 20, 21. And we haven't really completed this...

29:34 I said yes, and he said we'll call it 19, 20, 21!

29:37 Yeah, no...he's very modest...

29:42 The reality is that we looked at this and we realized, wow!

29:47 Five different ways of measuring a city. Five different ways of looking at it.

29:52 And we said, but there's a lot more to measuring a city than just the map. But there are the people.

29:59 So we started to look at it in terms of population density.

30:03 And again, working very closely with Hugh Keegan and his team...

30:07 ...we extrapolated some of the data that was available by ZIP Code...

30:11 ...and we extruded this map that allows us to look at New York City...

30:15 ...and the density of New York City and Manhattan and Brooklyn...

30:19 ...predominantly in Manhattan and Brooklyn, and we started to see a pattern emerge.

30:24 And we compared that to a few other cities, like São Paulo, where it's not quite as concentrated in one area.

30:32 Or Paris, which is even more concentrated, much smaller population, but a density and a central district of Paris that defines it.

30:43 So we went back and we looked at New York, and we said well, there must be other ways in which we can examine New York.

30:50 And we started to work with some students from Columbia University and working with GIS mapping and data software from Esri.

31:00 We assigned a different form of mapping to this same map of New York.

31:05 And we used population density by a simple dot representing 250 people.

31:10 But then we were able to attach additional data to that dot, and we started to look at it, and we added education.

31:19 Now, New York...only 17 percent of our population has no high school diploma.

31:27 Another 49 percent, and you start to see the greater New York area light up, has a high school diploma...

31:34 ...and then, interestingly, only 34 percent with a higher education, and you not only see the density in New York itself...

31:44 ...but you start to see the suburbs, the more affluent suburbs of New York lighting up as well.

31:50 Now the compilation of that starts to teach us something.

31:53 And if we take a closer look at just Manhattan, we begin to see a pattern.

32:00 I don't know how many of you recognize Manhattan in that rectangle which is Central Park, pretty well known.

32:08 On the right hand side of Central Park, of course is Fifth Avenue, and you see this precipitous drop.

32:15 The very edge of that red line is 97th Street, a hill.

32:20 So once again, a very simple form of geography affects where people live...

32:27 ...and separates those people in the most amazing way, a very definitive way.

32:32 Similarly, if you look at the lower section of Manhattan, the area that we finally call Chinatown...

32:38 ...but it's really the lower east side; it's a large immigrant community.

32:43 New York is largely made up of an immigrant community...

32:46 ...but that area itself shows an area in which the inhabitants are not necessarily, this week, with a higher education than high school.

32:57 But if you look at this same information by household income, you start to see the same pattern form.

33:03 If you look at it by age, it becomes a little more spread apart.

33:07 But if you start to then do a deeper dive and look at information by age...

33:12 ...if you say New York City, with it's larger immigrant community has actually a younger community...

33:19 ...30 percent of it is 0-19 years old, versus Tokyo only 12 percent.

33:24 But Tokyo measures in with a whopping 69 percent of its population is of a working age, 20-54 year olds.

33:34 And that's 69 percent of the 42 million people that we pointed out earlier. So that's an enormous productive society.

33:43 And interestingly, the geriatric population is pretty much the same across all three.

33:49 We go a little further to modes of transportation...

33:54 ...and you'll notice that 62 percent of New Yorkers use either a car or a taxi as a means of transportation.

34:02 Well, that's a bit of a problem; it makes for a lot of traffic we know.

34:07 Actually, our mayor was trying to figure out a way to rejig those tax dollars.

34:13 Because if you look at the geopolitical map of New York...

34:17 ...actually that number jumps precipitously from only 35 percent of New Yorkers take...take...

34:25 ...use automobiles, but 38 percent versus the 16 percent prior use the subway.

34:32 And this was the whole argument for congestion at taxation.

34:37 But if you go further to modes of transportation and we look and we see the 63 percent in

New York versus 19 percent in Shanghai...

34:46 ...and you look at the other modes, public transportation all being pretty much the same, but when you look at all other...

34:54 ...we found the fact that only 1 percent of New Yorkers take bicycles and 25 percent in Shanghai.

35:03 And if any of you visit New York, you're going to see an enormous number of new bicycle lanes being put in by the city, very innovative lanes.

35:12 In fact, 622 miles of bicycles lanes have been added to the city...

35:17 ...because they want to encourage more people to use a cleaner, more efficient, healthy form of transportation.

35:24 And speaking of health, let's talk about hospitals for a second...

35:29 ...because we have a reasonable number of hospitals throughout all of New York City.

35:34 We have an amazing concentration of the hospitals with a significant capacity, however...

35:41 ...are really only and mostly on the island of Manhattan, with one all the way out in Queens near the airport.

35:48 We have had 16 trauma centers in New York.

35:54 We actually, sadly only have 15 now because we've closed one of them.

35:59 And the one that we closed, speaking of walking distances...

36:04 ...and these show the average time of seven minutes from the outer circle to be able to walk to a hospital.

36:11 So I know you make fun of how long does it take you to get there...

36:15 ...but if the transportation systems aren't working, walking factors are a big issue.

36:20 And if you look at the lower section of Manhattan, you'll see that St. Vincent's Hospital...

36:25 ...which is the one on the left side of Manhattan, is the hospital that they closed.

36:31 The very hospital that many people walked up to after 911. So it's an amazing thing.

36:37 So the city then has to compensate for the reality of this possibility of one less trauma center...

36:46 ...or even, how do you feed people to those trauma centers?

36:50 I want to say one little thing about health, because Esri has a whole health division of doing health maps...

36:55 ...which I'm obsessed with and really interested in lately.

36:59 And Bill Davenhall runs that.

37:00 And he came and gave a little speech last year in San Diego about, that where you lived in your whole life...

37:07 ...should be part of your health record...

37:09 Right.

37:10 ...because it affects your life...

37:12 ...of where you've lived actually affects what diseases you get, and it should be part of your health record.

37:17 And then we started looking at health things, and I asked the people at Esri, because we were going through the Swine Flu thing...

37:25 ...in fact we gave Swine Flu shots out at the conference last year by CVS.

37:29 And so I got sort of obsessed with Swine Flu.

37:33 And I realized that the only thing that was being published by the government of where you could get Swine Flu...

37:39 ...when we're all worried about standing in line and getting Swine Flu, was certain hospitals and certain governmental things...

37:45 ...and I realized that, if you put also in the map and you map Wal-Marts, and Walgreens, and CVSs across the country...

37:53 ...which they could get a map like that, literally within 15 minutes they sent me the maps, you increase...

37:59 ...and in every one of those stores, there's somebody who can give an inoculation.

38:02 Because every pharmacist can give inoculations.

38:05 You increase the network for response to an emergency.

38:09 There's different ways to look at all these maps depending on what questions you have...

38:14 ...and wouldn't it be nice comparatively to see that around the world, of different levels of network?

38:20 Sorry, I just wanted to drop that in.

38:22 He's allowed to interrupt.

38:26 So if you look at these, if you look at this issue in terms of emergency management...

38:32 ...and you strip the trauma centers away, you now can see the city actually uses designated stations for parking...

38:41 ...and having standby EMS services to be able to transport people to those trauma centers...

38:47 ...and those move based on every day's events and where they think they best need to have the support...

38:53 ...to be able to get people most effectively to a trauma center.

38:58 Beyond that, of course you have to look at crime, because they are somewhat related to trauma.

39:04 Fortunately, New York's crime rate as we probably all know has dropped precipitously, thankfully.

39:12 We have quite a bit of nonviolent crime, and if you compare nonviolent with violent crime...

39:18 ...the city itself is able to learn a tremendous amount about the patterns that are formed in crime...

39:24 ...and Esri has worked very closely with New York in that regard in its police precincts.

39:30 And even if you look at something like nonviolent crime and something as simple as auto theft...

39:35 ...you start to see a real pattern of where it occurs, different ways of interpreting it...

39:41 ...the relationship of auto theft to assault crime...

39:44 ...and you see a very interesting shift that the police department begins to understand another pattern...

39:50 ...of where to put the social services that might be needed to help prevent crime...

39:55 ...which has been a very effective part of their anticrime work that they've done in the city.

40:01 And then if you take a deeper dive and you look at the Bronx, a neighborhood that's quite infamous in New York...

40:08 ...but if you look at the crime rates in the Bronx, they're quite problematic.

40:12 The interesting thing is if you can compare them to land use, both multiple dwelling as well as private dwelling...

40:19 ...you start to see single family and multiple dwelling, and you start to recognize another pattern.

40:25 You start to add to that the incredible amount of green space that we actually have in New York.

40:31 And if you concentrate on an area like the Hunts Point industrial area, which was a hot zone for crime...

40:38 ...you start to add a quality of life, you start adding green streets, you start adding pocket parks...

40:44 ...and you start to create something where the quality of life changes.

40:49 You add the bicycle lanes and the new bicycle lanes that are now being installed...

40:55 ...and you suddenly look at New York in a completely different way.

40:58 And with 26 or 27 percent of our land in New York actually dedicated to public parks...

41:07 ...the quality of life and open space is a very important issue to any mayor, to any city, to any citizen living in a city.

41:16 So all of those things combined were part of our initial study to prove that a concept like this would be a powerful tool.

41:24 Little did we know that all of you, working in the world of GIS, and Jack and his company and his incredible team...

41:33 ...recognized the beginning of what we were doing and really have been supportive...

41:37 ...because they see the potential of being able to add much more to this.

41:42 We looked at the observations of 19, 20, 21 as something that could be expressed across multiple spectrums...

41:50 ...creating a television series like the one you saw, Cities, which we're talking to a major global network about...

41:57 ...and being able to look at the multiple categories.

42:00 Traveling exhibitions, print materials, and other types of conferences around the subject of cities...

42:08 ...all are part of our vision of 19, 20, 21.

42:13 The subjects of exploration are quite obvious. It's all the huge categories of infrastructure.

42:18 They're all the things that affect the way people live, and understanding the way we live is a very important part of our future.

42:26 And finding that future first is part of 19, 20, 21's effort. And we see it in multiple ways.

42:35 We not only saw it as a television show, we obviously see it as an online initiative...

42:41 ...of course it can live with data that can be supplied through some of the crowd sourcing...

42:47 ...that Jack demonstrated earlier this morning, and being able to use devices like the mobile reporting that we also saw...

42:55 ...which could contribute to this information and literally through GPS understand the metrics of a city...

43:01 ...and be able to look up this information in really new and innovative ways.

43:06 And then, finally, to take it beyond the digital world to a physical manifestation of what Richard called the urban observatory.

43:17 And again, I said what's that, Richard? And he actually had it in his book 33 from however many years ago?

43:25 Some time ago.

43:26 And we realized, not unlike a planetarium, not unlike an aquarium...

43:33 ...there really isn't a place where people can go and learn about their city, and ideally learn about other cities from around the world.

43:43 So we mocked up the idea of the urban observatory.

43:47 And the idea being that it would be a place where you could physically immerse yourself with this information...

43:53 ...and be able to have it literally change as people interacted with the information, and be able to see it in a new and different way.

44:01 Have families, and adults, and people being able to come in, see it, engage themselves in this topic...

44:08 ...be able to learn more, and recognize that we're not a planet of countries, we're a planet of cities.

44:15 And someday, to be able to have this urban observatory, where one person from Shanghai...

44:20 ...could say hello to somebody from Abu Dhabi...

44:23 ...would be an amazing dream to be able to have essentially this concept of a virtual telescope between cities.

44:32 And that's pretty much 19...