

# Designing Resiliency in an Unsustainable World

## Winter 2013 CAED Hearst Lecture

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*The Hearst Lecture Series is organized every quarter by the Cal Poly's College of Architecture and Environmental Design. Distinguished professionals are invited for a college-wide presentation about their accomplishments. Invited by CRP, Lewis Knight spoke to a full auditorium about pressing environmental issues such as global warming, and how they are affecting our lives and our design professions.*

We are at a critical moment on the globe right now where we, as designers, need to think critically differently about everything that we do. We are at a point where we need to question everything that we have been doing today, in order to be able to define our futures, and it's you who are going to do that. You are the designers, landscape architects, architects, urban designers, and urban planners.

I am going to concentrate on the Pacific Rim, since 60 percent of global population growth and 60 percent of global trade is going to happen around the Pacific Rim. I also grew up in the Pacific Rim, in Australia (yes, we had kangaroos in our backyard). When I was growing up, when it flooded on one side of the Pacific Rim, it was dry and warm on the other. When this happened, the air was pushing 800 parts per million of particulates. Anything above 100 ppm can start to cause major disease.

What we have to start to think about doing is acting locally, thinking globally, and thinking really strategically and critically differently about all we do.

I've been practicing in the Bay Area for the last ten years, having escaped Texas to get there. I had a choice between Austin and the Bay Area, and I definitely chose the Bay Area. The problem with Austin is it's surrounded by Texas, and the Bay Area offers a lot of opportunities right now with an extraordinary wealth of talent that is starting to think critically differently about everything that we do.

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Note: FOCUS thanks Lewis Knight for the permission to publish his lecture. The editing of the original transcription was by Kayla Gordon, graduate student CRP, and revised by Vicente del Rio. The number of illustrations in this article is significantly fewer than in the original lecture.



California is also leading the way globally, in terms of trying to connect land use policy and transportation policy with AB 1493, AB 32 and SB 375, with sustainable communities and various greening strategies.

The critical thing is that planning tries to anticipate what happens as the population grows. In California, it is going to continue to grow. Right now, the Bay Area is sitting at about 7 million people, which is projected to go up by about 1.6 million people by 2050. The Greenbelt Alliance in the Bay Area believes that this entire growth can be accommodated within the existing footprint of the Bay Area, but the real implication is the cars and their mark in the environment.

Housing—Do we all want to live in the same type of housing? When there is so much energy, information and research which is proving that mixed-use communities are healthier and that they are better for us physically and emotionally—we shouldn't have to have debates around healthcare and ObamaCare.

So what's happening in the Bay Area? One of the big issues is the sea level rise, of course caused by global warming. They say the temperature is expected to rise 4 degrees Celsius by the end of the century, and that's a low-rise estimate. Over the decade that I have lived in the Bay Area, they have talked about sea level rises going from estimates of 15 inches to 55 inches, and now they say that the sea level may rise above 9 feet by end of the century. That's a lot.

We can start to think about the Bay Area and start asking ourselves the question: Where might that sea level rise impact us? We have some pretty good indicators; when we first came here, all of the salt marshes and all of the wetlands had been filled over time to create the cities that we see today, such as Oakland and Alameda. One entire end of Alameda is landfill.

The Chinese would actually call it “reclamation.” I don’t know how you reclaim land that wasn’t there, but that’s another question, right?

Now, what’s the impact of this? There are a lot of facilities which are going to go underwater which are worth billions of dollars, and which produce billions of dollars worth of GDP—including San Francisco International Airport (Figure 1). Since 55 inches is now a conservative estimate for mid-century, the airport is going to spend around \$400 million putting a levee around it. Except, Highway 101 goes up beside it, and it’s going to be flooded because Caltrans hasn’t got their act together. So, we’ll fly into San Francisco, but we won’t be able to get a taxi there. Oakland Airport is in the same situation, except it would flood earlier. The Army Corps of Engineers estimates that 260 of the major companies in Silicon Valley are currently at or below sea level rise (Figure 2). So all of you on Facebook, sell your shares now because they’re going to be underwater in ten years.

So, what are the impacts? The impacts are actually really interesting, and we’re starting to see them now. Irrespective of the restoration of the South Bay salt ponds, which is the largest salt pond restoration west of the Mississippi, we’re going to see major impacts on our wildlife cargos. The Bay Area is on the West Coast Flyway, and so there’s a major bird and habitat impact of sea level rise. We’re already seeing it in the North Bay in terms of flooding and some of the recreation paths, the high tides on the Embarcadero in San Francisco, and flooding on Highway 880 in Oakland. Oakland is currently going through a plan right now for Coliseum City to determine where the Raiders want to go, and hopefully they’ll be able to keep the A’s as a Bay Area team (Figure 3). But the entire site is projected to go underwater by the end of century, so why would you invest 1.5 billion dollars in two new stadiums when it’s underwater already?

And what happens in the city? We think that Katrina is a myth, and we think the impacts of Katrina are a myth, but they’re not. We saw it with Sandy in New Jersey, and we rebuilt. But why on earth would you rebuild on a sand dune?

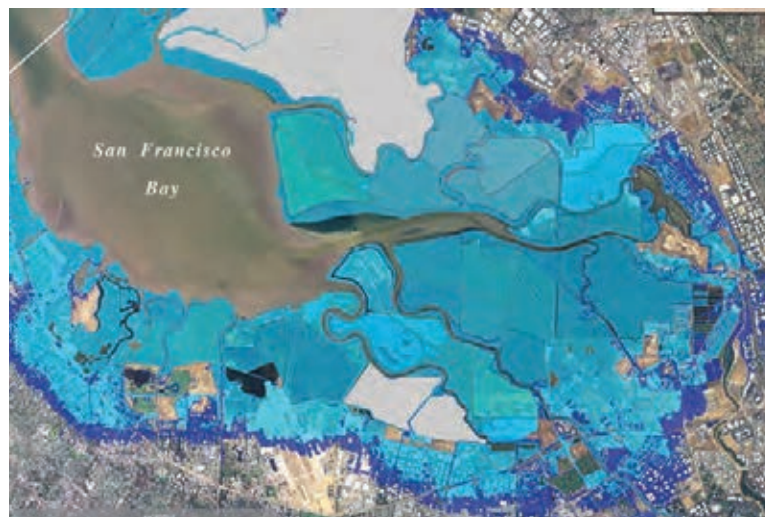
We’re seeing it in the recent flooding in Northern Australia, and we see it in the flooding in Southeast Asia. The Guangzhou Delta has projected to have 25 million people living below sea level who will all be swimming if a big storm comes in and beats the smart out of them.

Going back to the Bay Area, here is a 6 feet projection over SOMA in San Francisco. The impacts are amazing, and so, what we’ve been doing for the last century, particularly what we’ve been doing for the last fifty years, has been unsustainable. There are also other impacts: A lot of people talk about the economics of global climate change. We haven’t really addressed the issues of farming and agriculture. As the climate migrates, the Rice Belt migrates North and South, which impacts our ability to feed ourselves.

We’re still supporting 7 billion people today on the same



Figures 1 & 2: Sea level rise scenarios at the San Francisco International Airport area (above) and in the South Bay and Silicon Valley (below). (source: BCDC- San Francisco Bay Conservation and Development Commission)



amount of dirt or arable land which was supporting 3 billion people in the 1950s. And yet, we’re also not saving as much food for our futures. There’s one argument about the Middle East Spring that said that part of the reason Egypt fractured a year and a half ago was because they were getting food shortages. For the first time, Egypt went from a food exporter to a food importer.

Water is another big deal, and particularly the chemicals in our water. The best story is actually about the alligators in the Florida Everglades. PVC emits a chemical which is very similar to alligator estrogen, which essentially makes PVC a pill for

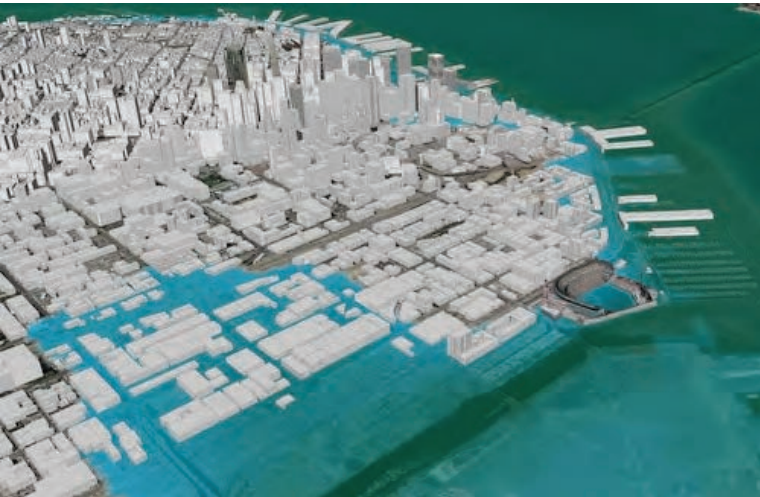


Figure 3: Simulation of the effects of the sea level rise in San Francisco. Note the impact in the South of Market neighborhood and the ATT Ball Park. (source: [http://www.openthefuture.com/2008/01/data\\_points\\_urban\\_futures.html](http://www.openthefuture.com/2008/01/data_points_urban_futures.html))

alligators. But what it's doing to the alligators is it's changing their genetic makeup, and there are now hermaphroditic alligators in the Florida Everglades because of the impact of the chemicals we're putting into our water.

It's happening to the fish and the Delta smelt coming down the Sacramento River. It's happening in the rivers in Europe. It's happening to the polar bears, particularly in the European Arctic as opposed to Canadian Arctic. It's happening with the pharmaceuticals that we're putting down the pipe because we're not fully cleaning those pharmaceuticals out of our systems. We are irrespective of what we're doing, and whether or not you claim it's human-induced climate change, we are changing our real environment in terms of our water and the land which supports us, so we need to think critically differently.

San Francisco is currently in the process of doing the Bay Area plan and since planning and politics take time, we might see some action by 2050, at which point Sacramento will be underwater.

I want to present you with a challenge: It's not just climate change. It's not just food change. It's not just water change. The base cause is population growth—by 2050, we're projected to have 8.9 to 9.4 billion people on the face of the earth. The extreme estimate says it's going to keep on going, and we're going to get to 11 billion people, maybe 12 billion people as a plateau at the upper end somewhere in 2200. To accommodate just the growth by 2050, we need to add 825 "Bay Areas" in terms of urban area globally. That's around 3,000 San Franciscos which is a lot of urbanism. It's a lot of architecture we get to do. It's a lot of parks we get to design. It's a lot of streetscapes, if you believe we should all be driving cars in the century that we get to design. But think of the world

with not one, but 3,001 San Franciscos—it would be pretty boring, wouldn't it? We're starting to see the impacts in terms of the way that people think about design.

My company Gensler is very new at planning the urban design. We've been starters in interior design firms, and space planning firms. We've added airports and train stations and commercial architecture and academics...you name it, we do it. It's only within the last 10 years that we've got into thinking really critically about urban design and planning. So what you're going to see now is some of the ways that we have been thinking about it within the last five years.

The starting place for that thinking is to confront our suburbs. There's a great advertisement in an online magazine, which said agriculture was sustainable until 1950. We were sustainable, largely, until 1950. And then for a number of reasons—the Eisenhower Highway Act, what happened in Europe, the decision to try and to segregate our population so that we're actually resistant and resilient to change—drove us into developing suburbs. That also came with the baby boomer generation, and a lot of other issues. It used to be that the cities were fearful places because they had the highest concentrations of carbon and methane emissions, particulates in the air, and all the other things that can make you sick. When you really look at it, it's the suburbs and the rural areas where the per capita carbon emissions are highest. The US currently sits at around 20 tons of carbon per person.

So we started working in Stockton, California, which for the last three or four years was voted the most miserable city in the country. Stockton has great bones—there's unbelievable agriculture, and it's a rich, historic city with its Hispanic community. However, Stockton was taken to court by Jerry Brown when he was Attorney General. We had started talking with A.G. Spanos (who was one of the worst single-family home developers you can come across) about one of the sites that Brown took the City of Stockton to court over. Think about what happened with Stockton—it began as a sustainable town in the 1950s, and if you were to project how it would look in 2040, Stockton through Lodi and all the way down to Turlock would be single-family homes—not really sustainable.

One of the things that happens with Stockton is its cheap housing, but, everyone who lives in Stockton actually works in the Bay Area, so they drive 60 miles to work and from work, and then all of people who clean their houses drive from the Sierra foothills into Stockton. Therefore, the carbon footprint of someone in Stockton is actually more than 20 cubic tons per year. Someone in India is around 1 ton per year. Someone in Japan or Europe is 8 to 10. So, you start to think about how exorbitant this is.

As a result of Jerry Brown taking the City of Stockton to court, the City said, "Well, we need to rethink our general plan a little bit," and they came up with this idea of a series of complete neighborhoods as district centers. The complete neighborhood



makes a lot of sense, right? It's a lot about having housing diversity rather than single-family homes. It's a lot about developing a local job base. It's a lot about creating a walkable, mixed-use community as much as Stockton can conceive it, which is a lot about reducing vehicle miles traveled.

I think the interesting question for us is what happens when all vehicles are electric, or all vehicles haul themselves from non-burn energy—energy which doesn't require us to dig stuff that we burn. The target being that by 2050, Stockton actually has to reduce its carbon emissions by 80 percent from 1990 levels.

Therefore, we went in search of a set of guidelines that said: "Rather than be prescriptive as a leader is prescriptive, can we start to get a little bit ambitious and proactive in terms of where we think about the community, and how we build a plan for the community." So we went to London to an organization called BioRegional, which does a thing called "One Planet Living." It has 10 simple principles around which to build a sustainable action plan, which includes the notion of zero carbon. Carbon is a really great indicator of our energy consumption, and the impact we have on global warming.

Zero waste: Our waste stream is enormous, and it's driving all sorts of environmental issues, the least of which being hermaphroditic alligators in Florida.

Local and sustainable food: In 1950, if you put a calorie of energy into the production of food and got it to your table, you'd have two to three calories to eat. With the industrial food system that we have today, you put 12 calories of energy into the producing of food, and you still end up with three calories to eat. What you were getting then was an--was raw, unprocessed, and better for you. Now, it's nearly straight sugar.

So, what do these things mean in terms of the principles? We actually did a comparison, and the site—the 1,800 acres that we were working on—had been planned by a civil engineer. After doing some calculations, the estimate was 16 metric tons of carbon emissions per person. So our plan—which

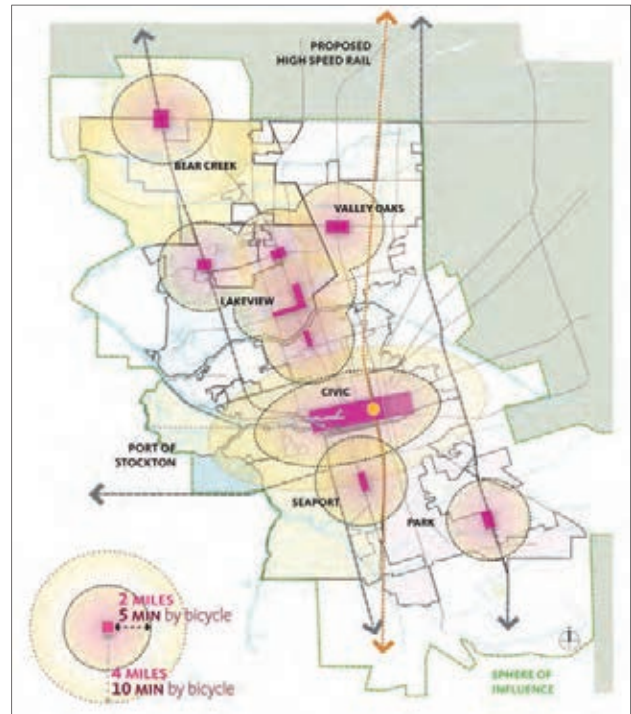


Figure 4: Proposal for Complete Neighborhoods in Stockton.

increases open space, which is set aside for habitat restoration, water management and local agriculture—looks like a pretty big improvement on business as usual (Figure 5). The one problem for us is One Planet Living doesn't like you working on Greenfield sites, and this is a Greenfield site.

The other interesting thing here is that CEQA is run by jurisdictions around specific projects, and it does not allow you to count the positive impacts of the project you are proposing. One of the critical things that we looked at here was, how do we truly create a job space in North Stockton, and how do we counteract 30 years worth of single-family (bad quality) development?



Figure 5: Gensler's illustrative site plan for a site in Stockton.

We have to get schools, we have to get education, we have to get hospitals, and we have to get primary jobs in the location. We did some planning diagrams and held community outreach events, which included the high schools and the hospitals, and we made the project transit ready. They are actually currently carrying the project through the EIR process.

However, the plan looks much different from what you might see. There are way more open spaces, way more habitat. There's many more wetlands. We are attempting to get to a water budget, which means that any water coming into the site is controlled on site. We think we can get to recharge an aquifer which is a big deal in this part of the Central Valley because of saltwater intrusion coming in to the agriculture aquifers.

The \$600 billion a year agricultural industry in the Central Valley is threatened because their water resources are becoming more saline. However, it stands a chance. The problem, though, is that Stockton is still miserable: They have 50,000 single-family housing lots already approved, which they need to un-approve. Then, they need to concentrate their energies and they need to be positive about the way they go forward, and they need to rebuild downtown Stockton.

We've also been thinking about changing patterns at work. The problem is that at a planning level, we're still thinking about work as being the suburban model: It's three people per thousand feet, and they all drive, so you construct about 1,000 feet worth of surface parking lots around 1,000 feet worth of building, which looks something like your dad's typical office park. I grew up in a town of 8,000 people, and I never saw one of these things until I came to the United States.

So, we went to work below sea level with Facebook. One of the really cool things out of this is they converted a million-square-foot campus that was done for a microsystem 25 years ago into their new campus. One of the problems that they had was a person cap of 3,000 people for the campus. And yet,

in order for Facebook to work, they needed to do two things. The first was shifting their servers all up to Oregon and Seattle where they could get hydropower that is carbon free and carbon neutral. They also told us: "We're not really interested in sustainability for our campus. We just want to do something cheap and nasty 'cause that's what we've been doing forever." As many environmental concerns came true, they changed their whole plan moving forward, since they realized how important sustainability was (Figure 6).

The tactical problem here is how do you convince a city that has said you're allowed to have 3,000 people, and you're allowed to have 2,800 car parking spaces to match those 3,000 people, to allow you to put six and a half thousand people into this million square feet, and plan for your potential growth for another three and a half thousand people?

What we did when we took the Facebook project through the EIR process is we converted a people cap to the campus into a vehicle trip cap for the campus, which means there is no net new increase in vehicle trips even though you're doubling the number of people using the space. This idea is fundamental to Facebook's corporate philosophy, and their financial success.

The question is, how are you able to be commercially viable within Facebook? It's a lot about buses, such as Genentech buses. It's around these things called Zimride, which is like a dating program for carpoolers. It's about transportation connections, bicycles, and starting to think about how Facebook starts to add housing stock to East Palo Alto, Menlo Park and Redwood City. So you need to start to fundamentally shift the system, and change it.

I have also been working in San Jose. My dad's office park: a "how not to do a dad's office park," where we are doing the first LEED-ND project in San Jose. San Jose has recently redone its General Plan, and they are the first city in the country to include a health element in their General Plan. They also did the North San Jose Plan, which includes an amazing set of urban design guidelines which are now being copied all over the country.

San Jose is a remarkably forward-thinking city in terms of its planning. We're doing the first LEED-ND project in San Jose, and yet we're gaming the system. There currently is not one iota of housing on this project—this is your dad's office park. However, we're experimenting with it—it's not all the same building type, and there is some flexibility to it. Some of the project could actually become housing, particularly some multifamily housing. It's intended to be a mixed-use plan, even though it's being sold in Phase 1 as an entirely commercial plan at 1.8 million square feet. The great thing is the developers are willing to flex a bit because they only need 1.2 million square feet on the site to make their money, and the city has given them the right to put 2.8 million square feet.

The economics of sustainability and resilience are really interesting: very quickly approaching the time where the

Figure 6: Illustrative site plan of the Facebook campus.







Figure 7: Bird's eye view and character renderings of the N1 Campus Master Plan in San Jose.



economics are going to be imperative that we do change and we can see the things differently. EPRI, which is a power research institute out of Stanford, has predicted that our energy prices in the next 10 years will probably go up by 400 percent if we stay on the same trajectory. The techs and the oil barons are radically trying to accomplish this because they're fracking the ground in Texas in order to produce cheap natural gas, which again has its own environmental issues.

Thinking about public domain, thinking about the quality, the spaces, the other common spaces of us all, I actually have a weird theory about American urbanism, which goes something like this: Hollywood invented the movie industry. They also invented the film set. The film set got translated to the way that we think about urbanism, particularly the new urbanists. We are more concerned about the façade, or the film set of our daily lives, than we are about the social connections that we have. It's most important that we have a set of connections, because that is our future.

We are also doing some work in San Francisco that is radically different. In the 1950s the *San Francisco Chronicle* employed 3,000 people in 4 acres. They had 300,000 square feet worth of development. It's a building which was once great, and it's been bastardized because of having to seismically upgrade it all the time. Fifty percent of the site is surface parking lots, and 6th Street has the highest density of SROs and low-income hotels west of the Mississippi. Mission Street, however (in the opposite direction), is being built up with 300 foot towers with million dollar condos. The really interesting thing is that when we started doing community meetings with condo owners, local business owners and the tech community, was that they all wanted the same thing: They wanted greater density of people on the street. It's that simple—they just wanted more connections, and they wanted more interactivity.

So we designed a project which is now starting the EIR process (Figure 8). The problem with it is that we breached every single one of San Francisco's urban design guidelines: They want tall skinny towers, we designed fat, solid towers. We connected over alleyways and we did connected floor plates. One of the things we heard when we were talking to the community is that the SoMa blocks are so long, and they're so windy, that you don't really get to interact in a public domain.

Here's my rule number one of urbanism: "The one-minute rule" of the great walkable towns, and the great walkable cities. Every one minute as you're walking, you have to make a decision. You have to hang out for a moment, and you have to be social while you're waiting for the traffic lights. The same thing happens in cycling: Cycling, about every one minute when you're on a bike, you have to make a decision, which makes it a comfortable ride, and makes it an interesting ride. This is the same as driving. Freeway engineers put three-way intersections no more than about a mile apart, which is about every minute. "The one-minute rule of urbanism."

The second piece is thinking about the right kind of density. Forty years ago, San Francisco built BART, and Muni just turned 100. It's a really transit rich city, and it is the second most dense city in the country. Yet, Gabe Metcalf from SPUR has said that San Francisco needs to double its population. So we only have to build 2,999 San Franciscos by 2050.

BART stations are over capacity during peak hours, but this site is transit rich. We've got new transit lines, and we've got BART. We need to do lots of density, and it's going to have a regional impact. We talked about putting 1.8 million square feet on 4 acres, which doesn't sound a lot until you get into the FAR numbers, but it's the right place to do density.



Figure 8: The 5M Project in San Francisco proposes a different mix of uses and high densities.

Think about the civic spaces, and how they've changed. Think about the way that people changed over time. The way that we inhabit public space is going to change radically. With wireless and the cloud, we can do our business anywhere now. What you're doing now may not be the same in 20 years time, because computing power and the connections are changing so radically that we can do our work anywhere.

The other question is thinking about dynamic floor plates and floor plate sizes. This is where we need to question "business as usual". The best way to think about this is think about if you're a startup firm: A hundred years ago as a startup firm going into Wall Street, your company was likely to have a 95 to 100-year lifespan. Today, a startup firm has maybe a 15-year lifespan. During those 15 years, they can go up to 10-15 thousand people, and then scale back down really fast. The big cost for them is hopscotching around the city, trying to move into ever scaling spaces, and then getting 60 percent of their population of "engineers with earbuds on," communicating because they need them to drive innovation, and change, and collaborate. The notion here is that if you think about 60 percent as horizontal floor plates bridging across alleys, you can actually drive that collaboration to happen, get them out of there, get them out of their cubicles, get them clever, and going to coffee shops and tech shops, such as the Hub in San Francisco.

There is also something here about legitimacy and authenticity. I think people are done with the Hollywood film set school of urban design. We need a little bit of authenticity about the way we do things, and that ground plane needs to be democratic. Everyone is complaining because we are putting too much density on the project, we're bridging it over streets and we're doing some things that challenge all of the fundamental norms;

and it's the CEQA process which is holding us up right now, it's the CEQA process which is probably not going to allow this project to come to fruition. So, should we then move to places where there is no environmental control?

Now I would like to address some of the work I have done to rapidly changing cities, such as Shanghai and its old town. How do you start to think about social sustainabilities and retention of those things that are authentic, retention of zoos and museums, parks, open spaces, that are really important for the functioning of the city—by starting to cluster the density and by utilizing TDR programs? That will ultimately provide a much richer environment. Also, don't be scared of height, height is okay. However,

height indiscriminately is not okay. In Shanghai, the height is located around transit, and it's designed to help reinforce and support the historic city (Figure 9).

And now we go back to the idea of land reclamation and landfill. Most of the cities from Hong Kong all the way up to Tianjin including Shanghai and Wenzhou get free land by doing landfill. So we did a competition for Wenzhou, which develops free landfill (Figure 10). One of the interesting things about Gwangju, though, was that over time, it lost its economic base—it has been a great shipping port, and because of the strength of the Wenzhou Delta, it needed to stop to rethink about itself. It's also dealing with extraordinary organization at a rate that we actually can't conceive when we're sitting here either in the Bay Area or San Luis Obispo. So, it needed to fundamentally rethink its economic base in a manner which was different from every other coastal city in China.

It's really about being smart—the smart city is sustainable, it's deeply mixed in terms of its uses. There is a really deep connection to art and culture that is responsible about having a social domain. We can't continue to exist as isolated individuals and we need to be transit-oriented.

Figure 9: Project for central Shanghai.







Figure 10: Renderings of the proposal for the Wenzhou peninsula master plan competition.

Wenzhou is about the same size as Manhattan, and it's in a typhoon zone. You can't build it in five years, it needs to be able to be scaled over time, so the island itself is designed to be resilient on a phase-by-phase basis, as are the energy systems and the water systems and the social systems with community support.

We have also done some work with campuses, specifically Renmin University in Beijing. It's "the People's University." It's the third of the three major universities in Beijing, with Peking and Xianghua being the other two. This project is a major expansion for the University, with 30,000 students, outside the 6th Ring Road east of Beijing. With this project, we fundamentally challenged the Chinese government and said, "You guys actually need to think about this as a living-building campus."

The Living Building Challenge is an offshoot in Seattle out of USGBC and a few other very intelligent people. The Living Building Challenge's fundamental thesis is that instead of checking the lists, we have to get predictive about what our buildings are going to do, what our landscapes are going to do, and what our urban centers have to do. This is extremely important because we're building and we're designing buildings now that are going to be occupied by mechanical systems until 2050. In 2050, our climate is going to be at least 35 degrees Fahrenheit warmer. That doesn't sound like a lot, but the volatility of the 35 degrees is enormous, and the systems that we are designing now are not going to be able to cater to the climate that we're going to be producing. Therefore, we need to be way more advanced.

The really great thing about Living Building Challenge is it asks us to be a little bit predictive and it gives us a very simple framework in which we have around seven petals and twenty challenges. In terms of the water challenge, there's a lot of re-use and recycling of water coming out of the river. Since the campus is on the river, we believe we can use geothermal to

basically power the entire campus. The plan is actually radically different from the other four competitor's schemes: They all have their 10 hectares worth of water, their traditional Chinese communist buildings. The plan is actually really simple—it completes the Beijing axis and goes all the way back to the Imperial Temple. It provides the communist party their royal address as you come in and pass the student center and the performing arts center, and the hall of fame.

However, we did a few things differently. We said, instead of having 10 story academic buildings and labs, you need to have no more than six stories and reduce the number of elevators so everyone has to climb the stairs. We also said that instead of being divided into five colleges, you need to take 20 percent of the program out of each one of those colleges and establish a future institute, which needs to see the axes of the plans, but not close the Beijing axis. However, it starts to have a really high sustainability quotient. It's all about the quality of the landscape, the quality of the architecture, and the inspirational quality of the engineering that goes into the building and the landscape collectively, and that it changes over time.

Universities have traditionally had cloisters, and they've been all about exclusive thought. One of the things that we've said in terms of establishing this forest of growth is that this was an expression of the cloister and the meditation that happens in that cloister in a big landscape move. Every time when you went in to the academic core, you had to go through a landscape cloister—you had to actually go through an inspirational meditation as you went to and from campus each time.

If we win, we get to create a living building campus which is all about connection. Social sustainability is the key, and social resiliency is the key. You take a look at disaster recovery and disaster preparedness out of Sandy, out of bush fires in Australia, out of any of the flooding, out of what happened in New





Figure 11: Renmin University master plan competition.

Orleans, and the communities which recovered fastest were those which had the greatest connections.

Finally I wanted to end with our proposal for the 2016 Olympic Park Master Plan in Rio de Janeiro.<sup>1</sup> The team had The SWA Group and other professionals, including CRP professor Vicente del Rio. We came close, our project was the runner up. The competition site was originally used Formula One track, 15 miles out of downtown Rio de Janeiro. The great thing about the last few Olympic Games is the development of the idea that they have to leave a legacy to the city; before the only interest was in the sports. In Helsinki through Melbourne, Stockholm, Rome, and Tokyo, the Olympics have all helped produce livable cities which rank really highly in any of the global livability or sustainability or innovation matrices.

We realized that we really needed to underpin the entire site plan with six very simple approaches to site sustainability, and

think about the plan in terms of games mode. Games mode is four stadiums, a warm up track, the aquatic center, gate and ticketing where you're getting 200,000 people coming in and out of the gate at one time (Figure 12). There are also tennis courts, the Velodrome, field hockey, a TV center, hotel, media... a whole variety of structures with 250,000 people in the space. So we decided that this was a radical opportunity to increase environmental sustainability for the site. While establishing infrastructure to cater to 200,000 people, we can start to think about changing the plans. When the athletes have gone away, we can create a new town for 25,000 people which may fundamentally reshape this part of Rio, and can build upon the urban infrastructure that we put in place for the Olympics.

Figure 12: Master Plan Competition for the 2016 Olympic Park in Rio de Janeiro. Project shown in Games Mode.



<sup>1</sup> See the article on this project in FOCUS 9, 2012.