THE BROOKINGS INSTITUTION

THE INNOVATIVE METROPOLIS:

FOSTERING ECONOMIC COMPETITIVENESS THROUGH

SUSTAINABLE URBAN DESIGN

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PARTICIPANTS:

Welcoming Remarks:

STROBE TALBOTT
President
The Brookings Institution

MARK WRIGHTON
Chancellor
Washington University in St. Louis

Overview:

PETER MacKEITH
Associate Dean
Sam Fox School, Washington, University in
St. Louis

Keynote: "Living in the Endless City":

RICKY BURDETT
Professor of Urban Studies, London School of
Economics and Political Science
Director, LSE Cities and the Urban Age Program

Panel 1: Transportation and Mobility in Portland, Copenhagen, and Hong Kong:

Moderator:

ROBERT PUENTES
Senior Fellow and Director, Metropolitan
Infrastructure Initiative
The Brookings Institution

Panelists:

Portland: CHANDRA BROWN
President
United Streetcar

Hong Kong: JONATHAN SOLOMON
Associate Dean and Associate Professor
Syracuse University School of Architecture

Copenhagen: OLIVER SCHULZE
Principal
Schulze + Grassov

Panel 2: Environmental and Building Technologies in Chicago, Sao Paulo, Masdar, and Helsinki:

Moderator:

CHRISTOF JANTZEN
I-CARES Professor of Practice
Washington University in St. Louis

Panelists:

Sao Paulo: FABIO MARIZ GONCLAVES
Professor of Landscape and Urban Design
University of Sao Paulo School of Architecture
and Urbanism

Chicago: GORDON GILL
Principal
Adrian Smith + Gordon Gill Architecture

Helsinki: JOHANNA KIRKINEN
Energy and Climate Change Lead
SITRA - Finnish Innovation Fund

Masdar: ERIK OLSEN
Partner
Transsolar

Panel 3: Adaptation and Renewal in Shanghai, Mexico City, And New York:

Moderator:

MICHELLE KNAPIK
Director, Sustainable Environments Program
Surdna Foundation

Panelists:

Mexico City: VALENTE SOUZA
Director, IQh

Shanghai: SENG KUAN
Assistant Professor
Sam Fox School, Washington University in St. Louis

New York: ALEXANDROS WASHBURN
Urban Design Chief
City of New York

Keynote: "Ecological Urbanism":

BRUCE LINDSEY, Introduction
Dean, College of Architecture and Graduate School of Architecture & Urban Design
Sam Fox School, Washington University in St. Louis

MOHSEN MOSTAFAVI
Dean and Victoria Wiley Professor of Design,
Graduate School of Design
Harvard University

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P R O C E E D I N G S

MR. TALBOTT: Could I have your attention? There are some additional seats, at least a few up front for those -- I don't want to have anybody have to stand.

A hearty good morning to all of you. My name is Strobe Talbott, and it's my honor on behalf of the Brookings Institution to welcome all of you here this morning to a joint symposium that is sponsored by a number of my colleagues here at Brookings; the Metropolitan Policy Program here represented by its co-director, Amy Liu; and the Sam Foxx School of Design and Visual Arts at Washington University in St. Louis.

Now, let's just pause a little bit on that match-up. It's a somewhat odd coupling. On the Brookings end, you have a lot of expertise on governance, policy, and politics in their most nitty-gritty form; and on the Washington University side you have a lot of expertise on esthetics, beauty. Now, you can't get two things further apart, it seems, than those two fields of endeavor. But, in fact, the two fields do come together in the area of urban design, and that is the focus of today's event, because the ways in which we shape our cities, the ways in which we lay out our streets; construct our buildings; use our public spaces; use or sometimes, unfortunately, abuse nature and the environment are a critical part of the way in which we make our cities, if possible, more attractive and more livable but also ways in which we can boost economic growth and sustainability. And urban design is going to be particularly important in the century that has now begun, because for the first time in human history, the majority of the population of the planet lives in cities or what we call metropolitan areas, and that percentage is going to go up to about 70 percent by the middle of this century.

We have three panels today. Each one is going to look at one American and two international metros, and the aim is to see if we can shed some light on what best practices should be in the area of metropolitan policy and urban design.

We're very honored to have two distinguished keynote speakers: Professor Ricky Burdett of the London School of Economics -- and, by the way, Amy and Bruce Katz and our colleagues in the Metro Program here have been partnering with LSE for well over a decade -- and Professor Mohsen Mostafavi from Harvard University.

Today's event is another product of a wide-ranging collaboration between the Brookings Institution and Washington University in St. Louis. Both of us have a common benefactor: Robert S. Brookings. His legacy has benefitted greatly both of these institutions and, in fact, made, as the name of Brookings would suggest, our institution possible.

Robert S. Brookings was born up the road in Maryland. Like a lot of young men in the middle of the 19th century, he went west. He made a fortune in St. Louis, and he donated much of that fortune to the University. He came back east to serve here in Washington as a Republican businessman in the administration of a Democratic President, Woodrow Wilson, thereby setting a high standard of nonpartisanship and bipartisanship for the way in which we do our work here.

Washington University and Brookings are collaborating on a whole range of activities including executive and online education and joint scholarship on public policy. We're very honored to have Chancellor Mark Wrighton here with us this morning. He has been the driving force behind the Washington University in St. Louis and Brookings Institution partnership. And, I might add, he is due much credit for the stellar reputation that Washington University has as a university of the highest quality and global reach.

And, on a personal note, I can say that in the several years that I've been working together with Mark, he has been a teacher. He has taught me a little bit of chemistry, more than I ever got as an undergraduate, and particularly chemistry as it

relates to the critical area of energy policy.

Now, before I the podium over to him, I do want to make a rather different sort of announcement than that I have made in years past. I used to always end these introductions by saying please turn off your mobile devices. Please keep your mobile devices on, as long as they're silent, and do all the tweeting you want as long as it relates to the symposium itself. The hash tag is **#innovativemetro**, so tweet away, and I wish you all a terrific program. I'm sure you're going to have one, and Mark will get us off to a very strong start.

MR. WRIGHTON: Good morning. Thank you all for coming. It's a real privilege to be here myself, and I'm grateful that my colleagues and collaborators here at Brookings have pulled together such an outstanding program on such an important subject.

Tomorrow Washington University will be celebrating the 160th anniversary of its founding, 1853, February 22nd. By the way, that's how we come to have our name Washington, that being George Washington's birthday. But in 1853, very relevant to this conference today, St. Louis, our home town, was arguably the most important city in all of North America. St. Louis was the gateway city for The West, and at that time it was felt that a great institution like ours should be developed.

Fast forward 50 years from, 1853 to 1903, Robert Brookings was playing a great role in civic affairs in St. Louis. And the following year, 1904, St. Louis hosted not only the World's Fair but the Olympics right on our campus in St. Louis. So, the founding of Washington University related very much to a great urban environment.

Robert Brookings played an important role in the development of our institution and, quite obviously, in the development of Brookings here in Washington, D.C. And I'm very pleased that President Talbott has supported the development of a

renewed partnership that has been rewarding to our faculty, to our students, and to many through programs like that which we will enjoy today.

However, as Strobe has pointed out, the urbanization of the world is ongoing and poses a great challenge as we look ahead. Our overarching goal as a university right now is to enhance our global leadership today to benefit America and the world tomorrow. Our faculty and students are working to develop design principles that will lead to sustainable urban environments. Innovative cities will be an important part of the world's agenda, and we hope to contribute in a positive way.

In the last several weeks alone, I visited Mumbai, New Delhi, and Accra in Ghana. In these cities we have important university partners that we're working with through the McDonnell International Scholars Academy. Indeed, we have 28 university partners around the world now, and many of them are located in important urban areas, some developing and emerging, others mature and very sophisticated. But we also know that domestically we face important challenges.

I could not argue to you today that St. Louis is the most important city in North America. However, there is a commitment to the revitalization of St. Louis in ways that will lead to its future sustainability and to create an environment for its citizens that will be very rewarding and will be a city with economic prosperity through the development of new enterprises stemming, in part, from our efforts to build innovation and entrepreneurship in our region.

Many of our faculty have been involved in these programs, and it's a reward to be able to recognize, here at our program, Professor Peter MacKeith. He's associate dean and a faculty member in architecture in our Sam Fox School of Design and Visual Arts. He was educated at Yale University and the University of Virginia, and he's been on the faculty at Washington University now for quite some time. But he's had

great international experiences, especially in Scandinavia. We're fortunate to have him as an academic leader at Washington University. He's been critical to the development of the Sam Fox School of Design and Visual Arts itself and has been a great contributor to the development of this particular program today. Please join me in welcoming Professor Peter MacKeith.

MR. MacKEITH: Good morning again. My name is Peter MacKeith, and I'm the associate dean of the Sam Fox School of Design and Visual Arts, Washington University in St. Louis, and I'm a co-organizer of today's symposium here at the Brookings Institution. On behalf of Dean Carmen Colangelo at the Sam Fox School, Dean Bruce Lindsey of the School of Architecture and Urban Design, and Professor John Hoal of our Urban Design Program, I want to offer our deep gratitude and profound appreciation to President Talbott and Chancellor Wrighton for their combined vision, energy, and support for these collaborations of the Brookings Institution and Washington University.

Over the last two years, working in particular with Nicole Allen, my colleague in the dean's office, we have enjoyed a productive partnership with Rob Puentes and Amy Liu of the Brookings Metropolitan Policy Group. We are very grateful to all who have given their time, counsel, and financial support to this combined effort. This partnership with the Brookings has been an ideal initiative for our school's purposes. As Dean Colangelo often describes, teaching and research at the school are informed by our collaborative and inner-disciplinary mission.

But in particular today, our focus on and our growing strength in the area of sustainable urban design is a result of strong research and knowledge creation among our urban planners, architects, designers, landscape architects, all in partnership with national and international policymakers.

We've identified this mutual common ground with the Metropolitan Policy Group and today hope to explore best practices in sustainable strategies and tactics that might foster economic development and, by extension, job growth. Good design, good public policy, and a good economy should be and must be mutually reinforcing each other. The aim here today, and going forward from here, is to thread together the virtues of all that we do in architecture, landscape architecture, urban design, and art with the research, public commitment, and policy expertise of the Brookings Institution and so to produce an even stronger fabric for education, professional practice, and metropolitan policy for our nation and worldwide.

Today's program will approach this larger, single aim through two keynote presentation speakers, and we are very fortunate to welcome Professor Ricky Burdett of the London School of Economics and Dean Mohsen Mostafavi of the Harvard Graduate School of Design and then three design and policy panels spotlighting Metropolitan case studies by city representatives from across the nation and the world. The success of this format, however, relies greatly on the engagement with you, the audience -- or should I say, more precisely, you, the citizens. And in the overall spirit of collaboration, we encourage your active participation in a day of animated discussion and dialog.

Additionally, for those who are members here of the American Institute of Architects, your full participation may well be motivated by the promise of AIA continuing education credits. (Laughter) And please see my colleague, Nicole Allen, down here in front, to register your number.

To begin our discussions, then, it is a pleasure to welcome and introduce Professor Ricky Burdett.

Professor Burdett is a professor of urban studies at the London School of

Economics and Political Science. He's head of the Department of Sociology and Director of the LSE Cities and the Urban Age Program. He's a global distinguished professor at New York University. His research interests focus on the interactions between the physical and social worlds in the contemporary city and how urbanization affects social environmental sustainability.

Professor Burdett was chief advisor on architecture and urbanism for the London 2012 Olympics -- and I, too, noted, together with Chancellor Wrighton, that relationship at least between London and St. Louis -- and advisor to the Olympic Legacy Park Company, of which I believe we'll hear a bit more today.

He was architectural advisor to the mayor of London from 2001 to 2006, and in addition to leading innovative research on global cities, Professor Burdett has curated numerous exhibitions including global cities at the Tate Modern, a fantastic display of visually and physically representing the state of cities in the world today, and was director of the 2006 Architecture Biennale in Venice and chairman of the jury for the 2007 Mies van der Rohe prize.

Co-editor of two books based on urban-age research projects, *The Endless City* and *Living in the Endless City*, Professor Burdett is a regular contributor to journals, books, and media programs on contemporary architecture and urbanism.

In November 2012, Professor Burdett became a member of the U.K. Government's Airports Commission. It is no coincidence, I think, therefore, that he has arrived by airplane from London just yesterday to initiate our proceedings, and it's again my pleasure to welcome him to our symposium and to the podium.

Ladies and gentlemen, Professor Ricky Burdett.

MR. BURDETT: Peter, thank you, and thank you very much for the two institutions hosting this event. It's a great pleasure to be back at Brookings, and there's a

particular pleasure in today's event being bracketed effectively by my own talk and by Mohsen's talk. Mohs and I go back 30 years, and he introduced me to my wife. And we're still married I should add. (Laughter) So, it's a great pleasure, really, to continue this discussion.

What I'm going to do in the time we have is race through some of the general work we've done at the LSE on cities around the world, and then I will focus on the London Olympics as a project that I think brings together many of the themes that are going to be addressed in later panels then, not necessarily as a sales pitch -- it's happened, it's there, and we can all draw our own conclusions from it -- but more as a methodology of working, which I think might be useful and instructive for discussion further on.

Now, what I'm going to talk about is very much framed by work that we've done now for over six or seven years at the LSE Cities, which is a center that is very into disagree as already described and therefore draws on work that tries to understand this process of change and the importance as has been stressed already by Peter between the physical world and the social world in all these very, very different environments.

And it's entitled, this talk and much of the work we do, the endless city, because the city is endless. Where's the end of the city? It's Mexico City, but it could go on. The camera could go left, right, up, down and it would never end. And the issue here, as Dan Sudjic, my co-editor of the book, in thinking of the title wanted to stress it's endless not just as a physical artifact itself in some parts of the world but also endless as a sort of process. Cities are joining up in regions and making mega-regions that we didn't know before.

But there are choices, and that's what this whole conference is about.

We don't have to keep on going this way. We know the consequences of Mexico City -- another view of it. When I took this picture a number of years ago, we know that if I went back in that particular slot, the whole of the green bit would have disappeared with very negative consequences on the environment, on commuting patterns, in a city which more or less still today has something like four hours' average commuting time. We'll hear about São Paolo and other cities before. Just remember that, for hours, Hong Kong, it's 11 minutes, right? Those are the differences we're talking about.

And we have choices to which way we go, how we design our environment, with very, very important consequences in terms of the human relationships within them. And if we have time, we'll talk about, later, what does it actually mean to live here on a 35-story rock a few inches away, so to speak, from another building. It makes one of the most efficient cities in the world, but some of the work we've done at the LSE is actually -- we created focus groups with people who live here. And the stories you hear about individuals and their sort of psychological relationship to their neighbors and to others are really quite drastic.

So, it's trying to really connect these two worlds of the physical, the sustainable -- very much what happens at the human scale, which is what we're very interested in. And I want to bring it, in a way, down to the ground, because, you know, here's another city that had choices over the last hundred or 200 years of how to organize itself in space. A rather messy city -- and I'll talk about that -- in many ways, even though here it looks nearly as good as Paris. (Laughter) But it had to take choices. It had to make choices, and the politicians today are making choices, which I would say are quite brave and quite innovative at the level of governance, at the level of design, and at the level of transport, so I think relevant to this discussion.

And I will conclude by talking in some detail about how an area, which for

200 years was really a backwater of London, a very necessary backwater, as all industrial cities have had to have those -- how it's being translated, transmuted into this sort of piece of city over the next 20, 30 years.

Let's just frame a discussion. Many of you, just looking across the room, know these statistics, but important to remind ourselves. Cities today, that is, any sort of unit over 50,000 or so inhabitants, produce of course around -- consume about 60, 70 percent of the world's energy. It's because they are active places where people go to work and do things. But together they also contribute something like 75 percent of CO_2 emissions.

So, small changes -- literally, small changes, 2, 3 percent in your CO_2 footprint -- make a big difference to the planet; hence, the examples we'll hear about later.

And something we're not stressing today but I think we should always remember is it's not just an environmental impact; there's a dramatic social impact of these cities as they grow, because -- in São Paolo but also elsewhere, and I'm not picking out São Paolo as a negative today as an example but there are many things about it that perhaps don't work -- you are confronting situations where now the seventh economy in the world, having just overtaken the United Kingdom with enormous wealth, faces these realities and the conditions you see here.

On the left-hand side, you have an informal settlement of favelas with little water and little infrastructure. On the right-hand side, you have new housing where the wealth is so great that every single resident has a swimming pool on each terrace. You know, is that the way to go? And given that one in three of every new urban dweller is going to be living in an informal settlement in a slum, there is a real question.

Where all this problem is, in a way, focusing itself is clear. I mean, many

of the choices of who's speaking here today reflect that. But what you see in this map, which we produced at the NSE a few years ago, is pretty straightforward. In dark green, in the middle of the circles, you see in all these cities more or less where growth was concentrated effectively over my lifetime, in the first 30, 40 years of my life, so from the '50s on. In the lighter green, and therefore, obviously, Europe, parts of the United States -- that's where the major growth happened. In the lighter green is where most of the growth was concentrated in the '60s and '70s, and in the white is where the growth is going to be concentrated over there.

Now, there's another way of talking about this. Every minute and a half that I'm talking to you, there is a new person who's either born or moved into many of the cities that the chancellor was talking about before that he's been visiting. In India or Africa, every minute and a half there's a new person actually moving into these cities or being born there. And think of the strain on the infrastructure -- just on schools, on sewers, on everything else. So, it's a very, very specialized thing to be able to talk about sustainability in Copenhagen, London, and elsewhere. But I think lessons need to be drawn, and that's why I very much welcome today's event, which is very broad in a sort of geographical context.

Because I'm from the LSE, I have to show some graphs; otherwise, you wouldn't take me seriously, particularly at Brookings, and not pictures. So, I'm going to show you just a couple. And this I think is important, really, for all of us.

Along here is the human development index of the U.N. Basically, the better educated you are, the better health quality, the better food, and higher unemployment, better wealth, the more you are along the right-hand side of this axis. And the vertical axis is, instead, the ecological footprint, broadly speaking. I know it's much more detailed than this, how much energy you consume, broadly speaking.

The dotted line is how much energy we consume in one earth; so, anything above the dotted line is in excess of one earth's capacity.

And what you see here, and, you know, I don't want to be unkind to our host, is the way we're going right? Yes? Great quality of life but terrible ecological footprint. And I think the issue for all of us here in studying cities is what can we do about -- particularly in these cities and countries that are here at the moment, here and here, China, in particular, Brazil, South America, as their HDI improves, which way are they going to go? Are they going to go there? Are they going to go here? And exactly why Copenhagen becomes an important model for so many of us.

So, that's really to frame the discussion; and some of the work we've done with other colleagues is about trying to understand issues of energy, issues of consumption, and the physicality. So, a few examples, a few very concrete examples -- and, again, I don't want to beat up on São Paolo, so don't take this personally -- but, you know, I could have used Los Angeles, but I'd be thrown out of this country immediately, I'm sure. But, you know, that could work, or many other cities -- Atlanta or others. Washington, I don't know well enough.

But what is interesting about this city and where the sort of ecological issues, the environmental issues, and the socials really come together is that you have an extraordinary, to me, city center. Extraordinary. In fact, quite beautiful. Most of it, for a number of years, emptied out because of fear, because of violence, and because of all sorts of other issues to do with property ownerships and other things. This city has grown exponentially. Not as fast perhaps as others now but nonetheless very, very fast for a period of years, up to 15, 20 years ago. And basically the poor have been moved out, but really out, far out.

Now, this looks like a beautiful sort of lake. It isn't. It's actually the water

reservoirs of the city. Most of these places don't actually have efficient toilets or sewers. I need say nothing else about what happens to the quality of the water and the risks that are associated with these issues.

Now, a lot is being done, of course, to deal with these issues, but this is a problem the mayor is faced with. The city of São Paolo has grown enormously in terms of its car industry. It's the engine of that nation. But how does it deal with the sort of consequences on the ground for people who live there? You know, if you have a car industry, as we've seen in parts of Europe, certainly in the United States, you know, you promote this, even if it does take up to four hours to commute. So, those who can afford to literally move around with helicopters, and this is not an exaggeration. There are roughly a thousand helicopters -- the same as in New York, the same as in Tokyo -- in a city where at the moment GDP per person is considerably less.

So, that's not one way to deal with it. There are other ways. We could, of course, have the mayor of Bogota or many other cities around the world -- there are ways to deal with this in a sort of light-touch way. Bogota, 7 million people, had a series of mayors who introduced the TransMilenio bus; dedicated lanes; cycle-ways, which connect out into the sort of seeming wilderness to allow the informal city to actually grow around it. This is actually what it looks like after a couple of years. As a result, this man, instead of having to sit in a car for three or four hours a day or take a bus, actually takes his kids to school that way.

Now, apart from the sustainability, Copenhagen, Danish-like lifestyles -- which is a bit weird when you think of it in Bogota being all good -- for me the most important thing apart from saving the planet and all that is the relationship between these three people. And it's a design issue. It's a choice. And that's why I think we're so interested in taking these discussions further.

We've done some work with colleagues at the NSE and continue to do it on -- you know, what is the future? Do you need to go up that graph that I showed you before? And these examples, which are very clear -- and I'm not going to go into it in detail, because they're going to be discussed later also -- basically show two very simple things, that as income per capita tends to grow, even in Berlin -- right? -- but not that much, what has been happening is that basically energy l'ampoules and CO_2 consumption per capita actually have dropped through policy initiatives, because people have had the courage to actually do something about it.

We could have added New York to this, Alex, but maybe you will talk about it later.

And here is where design, as President Talbott mentioned before, that Strobe mentioned before -- here the issue of design and physicality and urbanism really comes to the heart of it, and Mohsen's work, of course, in this field is absolutely fundamental. But creating place, creating density, bringing people closer to (inaudible), keeping them apart, not only has social merits but also has enormous environmental benefits.

One of the new things that we've done recently is not only studied density of population as we normally talk about it, which is residential density, which you see down here in the case of London -- London is a low-density city compared to many of the other cities that we've studied around the world -- but we've compared it to work density. That means how many people actually move on a daily basis to their place of work. And in London, for those of you who know it, it's really quite extraordinary to see how many people move -- roughly a million a day, something like that -- into the city of London, into the financial hub.

But it means you have to have an infrastructure of movement that can

deal with this sufficiently. In London you could say we're quite lucky because we have had one for more than a -- it was the 150th anniversary of the London Underground only a few weeks ago, so we have this sort of mature and very distributive system, which supports this efficient. London has an average commuting time of just about an hour, even though with these numbers.

Now, interestingly, New York, much higher residential densities. You see it there. Roughly the same number of people in London as in New York fit into half the space. It's a very interesting sort of dynamic. But look at that in terms of the New York sort of work density.

And therefore Hong Kong becomes extremely interesting with all the slightly negative things I said at the beginning where these two are actually much closer -- residential on the left, work density on the right. You have to travel far less if the two are close to each other. So, in terms of sustainability, and I'll come back to this, there are very few places that beat Hong Kong. It has an extraordinarily efficient system. Land is controlled rigorously and fiercely by actually the state, and property and prices are extraordinarily high, and the density of living, the sheer amount of space you have to share with others is incredibly tight. But the effect is there. Ninety-three percent of the population actually use public transport. Ninety-three percent of the population -- that means millionaires and billionaires -- use public transport, something that also happens in London, maybe in New York, and certainly hardly anywhere else in the world. That's very important. And average commuting times are roughly 11 minutes.

So, what does all this mean for London? I want to spend the next 10, 15 minutes, Peter, if that's okay, on the London economy, on London's growth, and how the Olympics has been used, let's say, as a way to bring all these issues of sustainability (inaudible) very widely, including governance issues together around the Olympics.

Now, this is an important view. It's a view taken from the city of London, our financial hub, looking east, looking out toward the docks, the area that for generations -- and everyone in this room will recognize this as a sort of problem that the post-industrial city faces -- an area that for generations has been abandoned because of closure of the docks, because of containerization, all the sorts of issues that we clearly understand.

And you see in the background Canary Wharf, a privately led development from the mid-1980s -- enormously successful. A hundred thousand jobs were celebrated there only last year, and that's extraordinary and has been a very part of London's global connectivity. This place is now doubling in size and, interestingly, with about 80,000 homes and with new offices. So, you know, there's a model of what might happen design-wise and, I say this with a certain amount of care, maybe not the best way to actually create a seamless, integrated piece of city.

But, you know, we have to experiment, and London has been very innovative at doing things and, importantly, not necessarily the right way. And I think to learn from those lessons is important, and Canary Wharf itself is, I think, actually learning from those lessons of the past.

Now, if I'd show you a picture of Washington, New York, Barcelona, you'd immediately recognize, oh, there's the Avenue, there's whatever. I show you this sort of grimy mess. It's London. That's what it is. What do you recognize in London? Well, maybe the brown thing called the River Thames. (Laughter) Maybe Regent's Park, Hyde Park, Victoria Park. But little else. It's actually not a city that is being ever planned. Christopher Wren tried it in 1667 and failed. But there are very important elements that you can begin to recognize, and the River Thames and Canary Wharf, which I just looked at there, are significant. And this whole area over here is where the Olympics were held,

and the regeneration efforts are concentrated where I want to go back to.

But when people talk about how do you regenerate, how do you actually accommodate the sort of growth that London is looking to in the next 10 of 20 years, if you just look at this picture, look at the amount of actually empty land that there is here. And I could continue all the way to the right. You can fit two Amsterdams -- two Amsterdams -- here and here. And Amsterdam "ain't" a bad place to live, right? So, it's interesting that those issues of density come into it.

And the River Thames -- these sort of expanses of the river as it goes to The East become very important in that. But London has done one important thing in terms of planning, which I think is the most precious gift that was given to us by Patrick Abercrombie in 1943, and that is the Green Belt. London stops at one point. Portland's got that. But very few other cities in the world have understood that. It's such a simple and fundamental concept.

So, when London in 2000 elected its first executive mayor, Ken Livingstone, for whom Richard Rogers and I work, he took the fundamental decision that even though London was set to grow by a million people next year, the Green Belt had to be reinforced, actually putting good pressure on redeveloping brown field sites in the heart of the city and elsewhere. So, simple things like that are very important.

Another way of looking at London, which is really significant, is in terms of deprivation. Basically, the darker the color here, the less educated people there are and the more teenage pregnancies, et cetera. And if this were Chicago, it would be very clear what you would have. You'd have an absolutely clear divide between south and north. If it were New York, you would have the Bronx, perhaps Queens, actually standing out. And if it were Washington, I think -- well, you all know better than I what that would look like.

In London, it's interesting. It's sort of patchy. Basically, if you're living in the suburbs, you're fine. It's quite interesting. That's quite wealthy. If you're living in central areas, not that fine, and particularly in The East along the River Thames. So, that was the first reason the politicians took the choice of spending $15 billion of public money for the Olympics right there. Might as well do it there than there or there. You're going to get much more political support. But let's not be cynical about politicians. Let's say they actually meant it, which I think they did. It turned out to actually work out very well.

London is growing. It's becoming more and more cosmopolitan. Most people now moving into London are not born in London. They're not born in the U.K. They're born outside. So, we're trying to match probably New York in becoming a sort of maximum city in terms of the immigration. And it was actually fascinating that we just got the results of the 2011 census and found that we had 400,000 more people than we ever thought we had. Four hundred thousand. That's quite a lot in 10 years. And 98 percent of them were actually born outside the U.K. Now, of course, that's led to one of the strongest things that London has been able to do over the years, which is actually to compete and do well, and that appeared over global economic recession.

London has also been innovative in the way it's actually gummed itself. Only in 2000 did we decide we wanted to have an elected mayor. That's after 1,800 years that we didn't have one. So, everything is possible. We don't have to be depressed that we're stuck with everything. We've got this guy who wanted the maximum, then we got this guy who said he doesn't. But more or less, they brought D. Boris Johnson, our current mayor. They both believe in these important principles of making London as sustainable a city as possible,

Unlike the mayor of New York, we're lucky that the mayor has total control over the whole transport system. There is no NTA, which sits somewhere else in

another city in the state to decide what happens. That's why Ken Livingstone had the courage and Boris Johnson more or less backed it to introduce congestion charge, and he was not kicked out. There he is smiling only a few years ago. That's why we did something in London that we hate to do, which is to follow the French with that. (Laughter) But most importantly in terms of this debate, we were able to create a London plan, which basically is predicated on this diagram. I'm going to spend a few minutes on that and then move on to the Olympics.

The London plan is the tool that develops the framework for future growth of the city, and very simple documents. It's about 300 pages. And at the heart of this is a diagram. What it shows is that all growth has to stop at the Green Belt. I've already mentioned that, so it's reinforcing. Secondly, it says we should promote growth, though, given that the population is going to grow along these two axes: northeast -- yeah, north and east and east. That is because that's where there's a lot of land and pretty good transport or improvements in transport. And then identified with the stars, opportunity areas where density can be improved and increased. That's a very, very simple model of a sustainable sort of development. We stole it from Copenhagen and many other places. Nothing here is original, as you well know. Where these two corridors come together is exactly where the Olympics is, in fact, located. And not only does the London plan identify where growth is going to be residentially but also where there's going to be growth in jobs. And as you can see here, it's all concentrated very much in these areas.

So, what did we actually do for the Olympics? You know, the event, two billion people watched it on television and liked it, on the whole. Some, particularly in the states, I gather, didn't really understand what the whole opening ceremony was about and therefore put strange (inaudible) in at the same time.

But there's no doubt that it actually did succeed in making Londoners and visitors to London sort of also rethink the way the city actually was used and is being used (inaudible). And the key diagram -- actually done by Case Costanza, a colleague, a Dutch architect -- when he won the competition for the legacy master plan was this one.

The Olympics is, by definition, for those two, four weeks a closed event. We know that. How do you, the day after, make it into a porous, integrated (inaudible), which the Senate would say an open piece of city.

It's located, as I've shown you, not only in a place that needs attention, love, and investment but also -- and actually one of the best internationally connected rail hubs of the U.K., and it's also, importantly, connected to a beautiful waterway and green system, which goes all the way up north across the U.K. Connections in terms of tubes, underground buses, is very, very good, and you can get into, let's call it, more central London within about 10 to 15 minutes, and great commuter services from outside.

And perhaps most importantly in terms of the next years, the Cross Row Rhein, the equivalent of the underground high-speed, Paris-like RER, which is under construction today, will link Heathrow Airport to this part of London in 35 minutes, which is an extraordinary change in terms of the sort of geography of London.

This is a roughly £20 billion investment, partly funded by government and partly funded by the private sector. So, let's look at the site. What you see in this picture is what it was like in 2003 when, more or less, we decided to bid for the Games itself. Very important, you see a large amount of empty area, which was a railway goods yards. You see an extraordinary system of water canals and everything else going from The North, as I pointed out before, down to the river, which is at the bottom of the slide, and then large amounts of industrial land of the sort that you all recognize.

These are pictures taken at the time, actually some parts really quite

beautiful, surrounded by some of the most vibrant ethnic neighborhoods of London. Very, very different communities, different ethnicities. Very vibrant nonetheless. One of the largest communities of artists anywhere in the world is concentrated just off to the side. It had also the biggest fridge mountain in London. Every time I threw out a cooker, it ended up here. Think of what this means in terms of pollution of this site. And it was crisscrossed by these major electricity pylons.

Now, it sort of helps when you've got $15 billion, that you can spend $300 million on undergrounding the wiring effectively. Otherwise, nothing would have happened there. So, you know, that's the great advantage of sort of public investment. All the land was actually cleaned on site, and the whole project was about this. How can you take a piece of land that was, in a way, separated from the rest and reintegrated with its surroundings? And I'm going to go through the scheme from the Olympics, what's actually happening now, and what will happen in the next few years.

So, there's a site. It has water. It has already some sort of parklands in the middle. So, decision one, make a great park and call it Queen Elizabeth II, and, you know, you win. (Laughter) So, that was the first idea. You have a park with water right in the middle of it.

That was a picture taken about three months before the Games started. From that dump that I showed you, that's what actually was concluded. During the Games it was used that way, and the game plan is very simple. We want this to be as good a park as Regions Park.

This was George Hargreaves as it happened to -- the design, an enormously successful project.

The second thing -- here's a site that was totally disconnected, had only one route across the site, because it was a big industrial dump. You know, no one

needed to go there. Thirty-eight new gateways, entrances, and connections, all of course funded through the sort of infrastructure that was allowable.

Now, just look at this bridge here and the other bridges that you see there. When you have 200,000 people coming out of a stadium, you need very wide spaces-- right? -- because you have to deal with that sort of number. So, many of the bridges were designed, and this cost more, to be oversized and then will be reduced. Today the brown bit is being taken away, and you only have the white bit left, because the white bit is about the size of half this room -- three-quarters of this room -- and it feels right for a sort of community while that one doesn't feel right if it's for a sort of residential area. Then follow other things. Put jobs, put housing next to where the transport is. In many ways, other things follow.

A major shopping center. Nothing to do with the Olympics. All private sectors created, already 10,000 jobs -- 10,000 jobs -- for this area. This is the Westfield Shopping Centre, an Australian group. And most of those jobs, particularly 6,000 of them, which were part time, are for women who work in the area, many of them Asian. This has a massive impact on what is actually happening there. Very much a mixture of the public and the private actually working together.

The Games itself -- why build a basketball stadium or a hockey stadium or a water polo stadium in London? There's actually no point. We don't those sports, and it rains all the time, right? (Laughter) So, build a basketball stadium, but build it to be demounted. At the moment, these are pictures of the thing being demounted, not being constructed, being designed to basically be taken apart. And Rio is now talking to London about possibly buying the whole stadium and taking it there. It doesn't matter whether it actually goes there. The most important thing is that all the material can be used in the future.

There's another form of sustainability: Keep only the infrastructure that you need. We don't have a major velodrome, so we built one and that will remain there. Our dear friend, Zaha Hadid, built what I think is one of the most beautiful swimming pools in the world. I'm showing you an artist's impression, because no one has seen this building yet, because the building itself has been designed to be retrofitted. If you remember, swimming is one of the most popular sports in the beginning. You need 17,000 seats. You don't want to go with your kids and have 16,950 empty seats for the rest of the legacy. So, Zaha designed it in such a way -- she calls it, in her voice, these ugly side wings. (Laughter) She hates them. But it's fine, because they're actually now being taken away, and we'll go back to seeing what this wonderful structure is like, and the community can use it. And even the major stadium and this, you know, rather ambiguous structure over here (laughter) are going to remain as features for the future.

So, this whole project -- and this is where I want to end -- is actually not about the installations themselves or the buildings but actually creating the spaces for a community. When you take away all those temporary structures, you have cleaned up land, you have it well connected, you have it accessible, and it becomes the footprint for some of the images I'm now going to show you for the new neighborhoods.

So, here's an area. This is what it was like only a few months ago, the velodrome in the background with the Hargreaves Park. That's what's going to happen. You're going to have a sort of new crescent of housing designed by sort of younger architects in the U.K. There's the velodrome in the background and a park in front of it. This is this massive sort of bridge that I showed you before connecting to the other side. This is James Corner's proposal of what might happen here in the future. And some of these things are actually now beginning to be realized, and that's how $400 million of the project budget is actually being spent. It was kept back to actually do this. So, even here

you see the Olympic village on the left. This new housing scheme is now being constructed as we speak, 900 or so homes, some of which we (inaudible).

Actually, one of the most interesting things -- and this is where I want to conclude -- is that just on the edge of the Olympic site, not in the site, one of the major universities in London, University College London, is now thinking of opening up a whole new campus, bringing something like 20,000 students, staff, and everything else that comes with a university to a part of London that was sort of forgotten.

So, in that sense, I think there's a story here about sustainability that goes way beyond the two-week event, way beyond just the issues of physical infrastructure. Green issues are very important event though I've hardly actually touched upon them but actually transform London in such a way that it rebalances the poor east and the rich west, so to speak, bringing that sort of level of investment that we can see here and going from this in 2005 to that but, most importantly, over a 20-, 30-year time scale to that. So, in that sense, we're creating a sustainable infrastructure, which actually is part of the DNA of London that we've had there for a very long time.

Thank you very much.

Do I moderate the -- right? Questions. Right? Questions? We have about seven minutes for questions.

MS. BEAR: Hi, Sandy Bear with Smart Cities Council. I'm so curious. As you study the evolution of a city or a city block, the genesis of it and how it morphs, are there elements that you could identify that say this place will become prosperous or deprived or are there universal elements that you see?

MR. BURDETT: I think it would be very rationed and wrong to say that in any way the form, however important of a city or city block, determines prosperity, and I don't think that's how the correlation actually works. What I think the work that we've

done and many others nonetheless sort of probably proves is that there are certain forms of integrated, well-connected environments, that if the other aspects of life that are so fundamental -- the economy, jobs, prosperity, education, and issues that I've touched upon -- are there, they provide that sort of possibility of integrated growth and interaction. What I'm really getting at is -- let's say the anti-city, the gated community, places of difference where people of different color skin, belief systems, and wealth live separately from elsewhere does not make a city and therefore does not make that possibility of rubbing shoulders with people who are different and do different things. And I think that actually is a very important part of prosperity and provides innovation over time that you don't actually expect and can't plan for. Much as we're talking to planners here, and perhaps I even end up wearing a bit of that hat, you cannot plan for making people either happy or rich, for sure, but you can certainly plan for not making people feel that they belong to a city. And that's what we're seeing in a lot of the emerging world environments, particularly designed as a result of fear, and that's an issue that I'm sure will come up later.

SPEAKER: Yes, good morning. Thank you for an excellent talk.

The question is on the London Green Belt, is there a policy that has been implemented on the areas of the Green Belt -- beyond the Green Belt?

MR. BURDETT: Well, there has to be; otherwise, we get what happens, for example, in Bogota, which is that property developers buy the land just outside and you get the land speculation issue.

Yes, that is exactly the case, and that is controlled by central government. And, in fact, you're asking me this question literally in a week in which this is being debated by Parliament in the U.K., because the new conservative and liberal democrat government is looking at ways of effectively relaxing the planning framework to

allow more housing to be built. And of course, one of these targets is the Green Belt. But the only way you can enforce that is to have stringent regulations in London that you can't go beyond, but that land outside the Green Belt for about 20 kilometers, roughly, is a no-go area. It's basically agricultural land, and to ask for a change of use you have to apply for planning commission to that local authority, but that will be designated as metropolitan open land on which you cannot build except for exceptional circumstances. So, basically it is controlled from two layers of government; otherwise, it wouldn't work.

Lady over there.

SPEAKER: Could you explain the cities and projects (inaudible) process for the design process and citizens?

MR. BURDETT: -- process form?

SPEAKER: Citizens.

SPEAKER: Citizens and projects (inaudible) for the design process.

MR. BURDETT: But in the Olympics.

SPEAKER: (Inaudible) projects there.

MR. BURDETT: For the Olympics, yeah.

SPEAKER: Yeah.

MR. BURDETT: You know, behind that question lies a lot of sort of debate in the common discourse about participation -- who is it for and who's involved. That red line that I showed you from 2003 -- there were about, I think, 48 residents and about 400 companies actually working on the site, roughly that sort of order. The Olympic site or the site that became the Olympics never had a sort of housing community. The people who are going to live there -- no one knows who they are, right? So, the first rock of the Olympic village, which I just showed you near the Westfield Shopping Centre, will in November this year go out to the market in terms of its first

residents. So, it is not known, as in many urban development projects, who the residents are going to be.

So, the question of consultation and participation is a complex one in the sense that you couldn't talk to the future residents because you didn't who they were. What certainly happened was a sort of dual process. One is a top-down process. The red line basically was owned by an organization called the Olympic Delivery Authority, which gave itself planning powers. This is a very English trick of how to get things done. But because it's in the middle of five very dynamic London burrows -- sort of local authorities -- there was very, very close collaboration with all of them in terms of what actually should be done here, and in that sense there was wide consultation with the burrows themselves as supposedly future inhabitants. But I think that's -- you know, there's an issue of time and efficiency, which can lead to all sorts of negative sort of solutions; and then there's an issue of actual consultation.

I have to say that, you know, the language I've been using about the nature of the place -- in London there's this complete shared consensus that this is what should be happening in East London. Many of the residents in the area feel this is a good thing. I mean, just think of the jobs. I haven't even had time to talk about the fact that there is one major school with 2000 students, which will be a state school, free. There are going to be five new junior schools, primary schools, health centers, et cetera, let alone the sports facilities and the parks. So, in terms of the sheer provision of excess infrastructure, new, high-quality infrastructure for anyone who's living around there, let alone the people who are going to move into it in the next 20, 30 years, is, you know, part of the carrot and not the stick approach to planning.

Gentleman over there.

SPEAKER: My name is (inaudible) and I work for the Technical

Research Center of Finland. I am also born in Amsterdam and took my first remarkable (inaudible) incidents in London, but that is maybe a sidestep.

My question is how do you mobilize the sort of effort without organizing an Olympics, basically?

MR. BURDETT: Without organizing?

SPEAKER: An Olympics. So, I would like to take the Olympics out of the equation, because, I mean, you wouldn't really want to advise people all around the world to organize an Olympics. (Laughter)

MR. BURDETT: There's a view in -- you know, London has -- the U.K. has a press, which is more violent, more aggressive than any of you from whatever country you come from in this room, right? (Laughter) So, the British press is active as sort of, you know, the watchdog for a last number of years on these issues. And seven years ago, the headlines, "What a bloody waste of money," "9.3 billion could be spent on hospitals" -- all that sort of thing -- the tide has turned very much. And the general view in response to your question is that probably much of this would have happened, because -- in response to the previous question -- it's in the Ethos of London, this rebalancing mode. You know, there's a tradition of a great humanist city. I mean, on the whole the aberration is Canary Wharf; it's not this. I mean, I would say, if anything, the DNA of how London occupies space in a more organic way is -- I think Mohsen might agree -- very much that.

The major difference of the Olympic Games is it accelerated this process by about 70 years. That's what someone who worked on -- in other words, that you can kick start it by putting in this -- I mean, the mere issue of taking the pylons down and putting the -- now, I think a developer, if they were given the whole site at a cheap rate and, you know, saw the London economy was growing, could do that. But it would take a

long time and a very courageous one to invest that sort of money up front.

So, what I would say in response to your question is that you don't need an Olympics to do these things. You need a vision and a mentality that prioritizes all the issues being addressed today. And the next most important thing is you've got to think of it over 30, 35 years and not over 2 or 3, which then comes to the problem of the return on investment of any private company, which we will talk about later. But, you know, belief in the public good is important, and the sort of shared sense that this is where we want to go is also significant. I think those things have aligned at the moment in sort of the London planning and community debate.

We're there? Thank you.

MR. PUENTES: Great. Well, thank you all very much. That was a tremendous, I think, presentation. While they're getting mic'd, I'm just going to go ahead and start the discussion.

My name is Robert Puentes. I'm a senior fellow at the Brookings Metropolitan Policy Program working on a lot of the issues we're talking about here today, all these things around the built environment, with particular focus on the subject of this panel on transportation and mobility, and I think that Ricky's comments and the comments we've heard today could not have been a better setup and a better framework for the dialogue and the discussion that we're going to have here today. He certainly highlighted London among other cities and metros.

We have three great panelists up here who are going to help me kind of walk through other international examples, and then also trying to put that here in a domestic context.

There are so many great notes I was taking from Ricky's remarks, tweeted out a bunch of great things as I'm sure you all did as well, but again, all those, I

think, a really great frame for what we're going to talk about here today.

So, let me just set this up quickly. And I think as most of us know, and as Ricky talked about and as we'll get into, in the cities and metros, literally all throughout the world, there are definitely ambitious plans and ambitious policies that are underway to develop robust transportation systems that are going to do -- or that are intended to do a whole bunch of different things -- to foster commerce and economic growth is clearly at the top of the list, reducing energy consumption, reducing carbon emissions, increasing safety is often forgotten about, providing equal access and opportunity to broad segments of the society.

All of these things are really important when it comes to thinking about the transportation systems and the programs and plans we have together, and it's particularly important to us here at the Metropolitan Policy Program at Brookings, but given our intense interest on trying to make sure that cities and metro areas, mostly in the U.S., but increasingly much more global, and working with these folks that are willing to explore new approaches to economic development and the role that infrastructure and transportation plays in that kind of growth, and that means an intentional focus on the key elements that we think of the economy, on globalization, on low carbon, on innovation, and opportunity, and making sure that that's the lens through how we look at transportation and mobility, not transportation for transportation's sake, or mobility for mobility's sake.

And while that's probably an easy thing for me to say sitting up here on the stage at Brookings, that certainly hasn't always been the case, particularly here in the United States where we've had transportation planning and decision making that's frankly largely been siloed in its design implementation, really ignorant of its impacts on neighborhoods and people, and really divorced from the larger economy.

Indeed, I think one could argue that all this investment really undermined the economy in some ways rather than supported the economy when not done correctly. So, while I do think a lot of that is actually starting to change in the United States, we have tremendous examples all over the place. You mentioned Washington. I think Washington Metro is a great example of where we see that starting to change, but I think that's why this panel is so important, because as we look at global metros, we do see exciting things that are happening literally all across the planet that contribute to mobility within the context of sustainable urban economy.

So, Copenhagen, for example, is widely recognized as one of the most livable cities in the world due, in part, to its transportation policies focused on the human scale -- we'll talk about that in a minute -- and that focus has given rise to a micro economy of firms and services that are dedicated to sustainable transportation. So, getting at the economy in lots of different ways.

Hong Kong is one of the most densely populated places in the world, it was able to take advantage of that density for things like astoundingly fast and cheap broadband access, but it also means a different type of transportation system to keep people moving, to keep them circulating, and to keep that economy humming.

And in the U.S., Portland, Oregon has a well-earned reputation for all kinds of start up companies, *Portlandia*, obviously everybody talks about the TV show, but has clearly emerged as the epicenter of a public transit renaissance that we think is underway here in the U.S., and today is still the home of the only American company building modern streetcars today. That's not just due to what's going on at the company, but due to that metro area's long-term commitment to public transit.

So, other metros we're going to hear about later today -- Masdar City, Chicago, New York -- they're also attracting firms and businesses because of their

attention to these issues, and that's what we really want to get at.

So, the goal for this panel is first to hear from those first three metros. They're going to help us understand how these places have become successful models for sustainable transportation and economic transformation, and then what lessons we can take, particularly for U.S. metros here in this country.

And we pulled together an esteemed panel to help us do that. I'm just going to introduce them quickly. I think we have bios, longer bios that have been distributed to everybody. I'm not going to be able to do justice to their qualifications.

So, let me just, very quickly, on my immediate left is Oliver Schulze, a partner at Schulze + Grassov, where his work focuses on the relationship between the built environment and people. He has done work all throughout the world, including here in the U.S., and will focus today on the great city of Copenhagen.

Next to Oliver is Chandra Brown, a VP at Oregon Iron Works and the CEO of United Streetcar in Portland, where I should point out is not just putting together kids of streetcars, but it's actually really building and manufacturing these things -- bending steel, doing things that I can't even imagine what they're doing.

And at the far end is Jonathan Solomon, the associate dean at the School of Architecture in Syracuse -- at Syracuse University in New York. Jonathan won't be talking about that city, although he has done work all around the world -- you can talk about Syracuse if you like -- but he's literally written the book on mobility in Hong Kong and will describe his work there.

So, again, bios for the panelists are on the registration table if you haven't already gotten one. So, let's just jump into it.

The plan is to start off with one broad question that each of the panelists are going to answer and then we're going to moderate questions between here and

there. We're going to have ample time for Q&A with the audience. We're going to jump into it kind of early, so get your questions ready, don't be shy, try to keep away from speechifying, which is exactly what I've been doing up here so far.

So, let's just start. So, for each of you, I'd like you to describe the sustainable transportation plans and projects in your cities and metro areas, and if you will, pay particular attention to the direct connection between those plans and projects and the goals of building a sustainable urban and metropolitan economy.

So, let's start with you, Oliver, and then go with Chandra and Jonathan.

MR. SCHULZE: Thank you very much, Rob. I hope you can hear me. My name's Oliver Schulze and I live and work in the city of Copenhagen in Denmark. You could call it a micro metropolis. We're not as big as many of the metropolitan areas in the United States. And I have the great privilege of being a visiting professor on the Master of Urban Design program in St. Louis.

And you could ask yourself, why on earth would you invite somebody who lives in Denmark to come and teach Master of Urban Design students in St. Louis, but I think there are a few things that I would like to share with you that I think American metropolitan regions can learn from. And maybe thinking back at Ricky's very exciting and interesting presentation, it made me think that, you know, the Olympics, as an event, as described, is something that compresses to a point in urban culture, and we've seen that London is transforming, really, development that would happen over generations into a very short event.

So, one of the conclusions, I think, should be that Olympics, of course, should happen every year in the future, so Olympics are needed in every city.

But I want to kind of contrast that, maybe, with Copenhagen, because as I was listening to Ricky I was thinking, we are -- you know, Copenhagen is a very steady

environment. Basically, everybody is as tall and good looking as I am, and in Copenhagen, really, there is characterized -- life is characterized lots by a certain continuity.

You know, we largely -- we all get up at 6:30 in the morning, we all eat oatmeal for breakfast, and a day in the life of Copenhagen is very much focusing leaving the house in the morning, whether alone or with your kids, either walking to transport or getting on your bike, and we don't do that in Lycra, we don't call ourselves cyclists, it's just what we happen to use, it's the fastest and most efficient way of getting around our city.

But it made me think a lot about the fact that our city prioritizes, yeah, soft ways of getting around, so walking, cycling, getting to public transit, and I think it has a remarkable impact on people. I cycle to my kids to school, so my kids are six and nine, and they will be sitting in one of these bicycles you can see in the image up there, and you can talk to each other. And I think it's for urban designers, incredibly important, the slow means of transport, actually, those means of transport that allow you to take in your city.

So, you know, if you're not surrounded by cubic meters of steel, you actually engage with buildings and people in another way. And that has a lot to do with the speed that we move around the city, and that, for me, is one of the great things about Copenhagen. You know, I think for kids, as you socialize kids very early on, develop, I think, a sense of autonomy because when they're six, seven years old, they will cycle to school. More than half of all school children in Denmark do cycle to school, not necessarily on their own, the parents will be cycling behind them or next to them, but I think there is a degree of emancipation and, yeah, kind of authority about your own life if you early on feel that you are mobile, you can move around.

And I think maybe today we're talking about the intersection of policy, economics, and urban design and I'd like to say that Copenhagen has achieved this against a national trend. So, in Copenhagen, we have more and more cycling, we have more and more walking, but that's happening against a national trend that is going the other way. So, indicators seem -- it doesn't seem to be the national diet of oatmeal, pickled herring, rye bread, and beer, and coffee that just results in that type of city. It does seem to suggest we need to intervene in it.

And Copenhagen is doing great things. So, we're already a great place for walking and cycling, but we have a policy that says we want to become the world's number one in walking and cycling, and to achieve that, we are actually prioritizing walking and cycling in our policies and in our city evolution, and we are innovating. You know, I think Danes are great at copying things. You know, people -- other people might have invented the kind of molded plywood furniture. We just do it better than the others.

So, Danish design, for generations, I think, has been extremely good at copying, but I think there are areas where we're leading, and I think mobility infrastructure is one of the areas where we are really leading, and we're innovating.

So, those parameters of innovation and prioritization are omnipresent in our culture, in our policy environment.

And it's very simple. It ends up with we invent ways that we can make cycling and walking more competitive, reduce travel times, both absolute and compared to other means of transport, like driving. We make it more comfortable by getting better and better at design. Our mobility infrastructure is actually fantastically well designed. And we increase people's sense of security, so apart from the comfort, we also make people feel that it is safer.

And I think it can result in an amazing result that, you know, yes, it works

great for us in Copenhagen where we're more or less a homogeneous society that is slowly transforming, but largely, we're all the same. But I do think -- and that's the reason why I also like teaching in the United States -- I do think North American metropolitan regions can learn a lot, and whilst you can't overnight just recreate the systems that we have, I think we can actually lay the seeds for a future where other lifestyle opportunities are possible, and that, for me, would be a great way.

We don't have to get everybody on bikes immediately. You maybe won't have one in three people on a home to work journey being on a bike in ten year's time, but maybe you can reduce the number of trips that people have to do to turn on the SUV. That would already be a great start.

MS. BROWN: Good morning, everyone. So, my name is Chandra Brown and I do run United Streetcar, builder of modern streetcars, headquartered right outside Portland, Oregon. I also am a vice-president at Oregon Ironworks, and we build boats, bridges, ships. So, I have the honor up here, I think, of the entire day, of being the only manufacturer. So, I'm going to talk about building stuff, and I'll put it somewhat in the context of Portland.

As many of you know, Portland -- we like to call ourselves the European capital of the United States. We are very bike-friendly, pedestrian, all that, but I'm going to talk a little bit more in specific about how transportation has really revolutionized our city. We're also probably one of the smaller cities represented here today. I'm going to tell you how it's really revolutionized it.

Latest stats, because this is the Brooking Institute, so I actually had to go find some good statistics for them. In 2012, our greenhouse gas emissions were 6 percent below 1990 levels and down 26 percent per person even though our population grew 26 percent. So, I like to point out, you know, when you talk about the United States,

which was a great point; that is not Portland. We're in the European level. We're below the curve. So, we are giving back. We are not a net user, and we take that as a point of pride.

So, we are very active in working to decrease that. And we do it through a lot of ways, and what I'm going to talk a little bit more about is kind of the economic development and job creation side, that's what I do, I employ people, I create work, and some fun other facts about manufacturing that a lot of people don't know is actually manufacturing jobs, in general, pay 21 percent more than average. One high tech manufacturing job creates 16 other jobs.

So, when you talk about the Olympics and the construction and what the things are that are built there, a lot of people don't realize that that's one of the most important factors.

Now, we chose to build streetcars because at the time, there were no modern streetcars built in the United States, none. We were importing them. And I thought, wow, you know, my company builds boats and bridges and space launch compacts. I'm like, why is no one building streetcars? And the reality is, and we all have to admit it, the United States is incredibly behind when it comes to rail in particular.

We have many great examples to follow in Asia and in Europe, but, you know, we knew that this is a growth market, this is important. We're now tracking probably 50 cities across the United States looking at streetcars. Right now we're building streetcars for Portland, Oregon, Tucson, Arizona, which will be their first rail project ever, and then also right here in Washington, DC down on H Street. So, we're building streetcars for that. And obviously Washington, DC is an incredible transit center here, so the fact that they're adding streetcar to the mix, it's the same thing that happened in Portland.

In Portland we have light rail, we have streetcars, and we even have an overhead tram, so we also -- you know, we beat Washington, DC in that one area. And we did it for economic development.

So, talking about the streetcar, you know, there's really three main factors that it has done to really revolutionize Portland, and Portland was the first city in the United States to implement modern streetcars. It's one of the reasons why we're there.

We wouldn't have even known about it, wouldn't even have thought about building it except Portland -- and they started really planning in the 1990s, and the first line got started in 2001. But I think the important lesson here is that there's really three factors that it does. A lot of people forget this. So, we're talking about transportation here. A streetcar is a transit vehicle. We move people from point A to point B. That's nice and that's good. A streetcar is a fairly slow -- we call it an urban circulator, different than a commuter rail or a light rail taking lots of people farther distance. A streetcar is more of a neighborhood circulator.

But it fulfills two other important roles besides that of just transiting people. The second role is, it's green. When we talk about these decreasing emission, how Portland has done it has really been a lot through the transportation system and the design. So, it's an electric vehicle, zero emissions, and obviously, it's getting rid of the cars and the other things on the road.

Basically, the Portland north/south streetcar line has reduced vehicle miles traveled by 70 million miles per year -- 70 million miles per year -- with just a small streetcar line.

So, I think that's really critical, that's the greening part. And you can use a variety of techniques. Streetcar is just one of the ways that Portland has chose to do it,

and now other cities are looking at it.

But I think, you know, my favorite, because I'm an economic development type person, and what I think is that the economic development that comes along permanent -- because rail is permanent -- is really incredible. In Portland, $3.5 billion of development within three blocks of the streetcar line -- $3.5 billion of investment, the highest density, all within three blocks of the streetcar line. So, what it really is, it's an economic development tool and that's why I think more urban centers, why we're tracking these 60 cities across the United States that are all looking at streetcars, and these include places you would never think, like Oklahoma City, Boise, Idaho, all the way across to the Washington, DCs and the Charlotte, North Carolinas, and San Antonio, Texas, all those are contemplating it. And really, it's not, again, just the transportation issue, it's now it merges, how it will also increase walking, how it will also increase biking, how it will decrease emissions, and then ultimately be a revitalization for some of the United States core cities, which, you know, I think we all know is a really large priority.

So, thank you, and I look forward to questions.

MR. PUENTES: Thank you. Jonathan?

MR. SOLOMON: Thank you. My name is Jonathan Solomon, I'm the Associate Dean at the School of Architecture at Syracuse University where I arrived this summer in July from Hong Kong where I had had the unique opportunity to live and work for the six prior years. This is a journey that was characterized by a close friend of mine as being analogous from the sublime to the ridiculous.

But in any event, one could not, perhaps, conceive of two more distant places in climate and in culture than Hong Kong and Syracuse. The juxtaposition, however, has been an exciting one for me because it's been an opportunity for me to take six years of study and research into the contemporary Asian city and apply it to

some of the challenges of the mid-sized contemporary American city, something I hope we can cant the conversation towards later today.

I spent almost five years in Hong Kong researching and writing a book that was published this fall called *Cities Without Ground*, which I think we have an image of, which attempts to map some of the consequences of the incredible density that Professor Burdett alluded to in his opening remarks, and in fact, showed images of.

The city of Hong Kong is largely known for these images of densely packed skyscrapers, steep mountains, et cetera, and what we attempted to do, myself and two co-authors, Adam Frampton and Clara Wong, in this study, was to map and illustrate a less visible, but, in our opinion, a more fundamentally transformative result of that density than the skyscraper, which is the kind of thick mat of publically accessible program that occurs at the base of all of that density.

Hong Kong is incredibly dense; it also functions on account of spectacular public transport and remarkable intermodal opportunities. It is not uncommon, for instance, to take a taxi to a ferry to a bus in order to arrive at your destination, and you can be confident in doing that that you can move effortlessly from one of those modes to another that your next vehicle will be waiting for you on time and that your passage from one to the other will be clear and straightforward.

At the same time that Hong Kong creates these incredible inter modes, it innovates a type of urbanism which rejects two millennia of urban planning based on the relationship of figure to ground, a relationship, which whether you're in the eastern canon or you're in the western canon, whether you're in the modern or the pre-modern, et cetera, defines the creation of urban hierarchy, the difference between public space and private space, et cetera.

Hong Kong, because of this incredible density, does away with ground

as both a physical and a cultural concept, and instead produces continually ramifying urban figures packed so tightly together that you simply move from one to the next in a spatial network, but without that kind of visual hierarchy based on the relationship of a figure to a ground.

On top of all of this, Hong Kong innovates a form of urban decision making which works through collaborative approaches to informal and formal decision making processes, something that I've been referring to as aformal urbanism. So, where you have, for instance, the informal city, the informal settlement, let's say, typically something generated from the bottom up by less empowered actors, usually in an extra legal if not wholly illegal manner, and usually producing virtually illegible results when looked at in plan or in traditional diagramming methods, and on the other side of the spectrum you have formal urbanism, government-driven, strictly legal, because it is actually generated by legal processes or government processes, and usually over legible -- if you think about the legacy of the modern city, laminating a kind of bureaucratic legibility over urban complexity.

Hong Kong has grown and the networks that make up Hong Kong's intense, three-dimensional, pedestrian accessibility, has grown through a collaboration between those two processes -- market based, informal decision making based on the needs of a given developer at a given moment, and top-down government planning combine to create networks such as the one illustrated here at the International Financial Center in Central Hong Kong, where private shopping malls, hotel lobbies, corporate lobbies, publically financed footbridges, transit facilities, et cetera, form a network that would not function if any one of those players made their portion of it inaccessible, but is the result -- is not wholly the result of any of them.

Finally, Hong Kong innovates a relationship between pedestrian transit --

pedestrian movement in three dimensions through public and private space, and the notion of the public realm. So, Hong Kong is often presented as being a city without public space because it is virtually without formally understood public spaces as we would view them in the western canon -- streets, squares, plazas, parks, they're few and far between.

In fact, when studied more closely, public activities bleed continuously through this ambiguous network of both publically and privately owned and operated spaces, so you get -- for instance, in New York you get movements like Occupy Wall Street occurring in parks adjacent to the financial district. In Hong Kong, Occupy Hong Kong, which was a very long-running -- ran for almost one year -- occurring --literally overlapping with the space of a global financial capital. It was an encampment under -- in the atrium under the famous Norman Foster HSBC Main Building.

Political protests occur on footbridges, art exhibitions occur in shopping malls, the list goes on. Hong Kong, if nothing else, exhibits the possibility that public space -- functional public space in the city does not need to look like a square, a street, a courtyard, et cetera, a park, in order to operate like one.

Thank you.

MR. PUENTES: Thank you. That's very interesting. I'm trying to write these -- making mincemeat of my notes, and I have a thousand questions. I'm very impressionable, so I'm going to start with you, Jonathan, just that last one, I'm struck by this point on the motivation for the different transportation elements in each of these individual places, and you talked about the motivation for what's going on in Copenhagen and you said that -- I mean, the reason you're biking is not for any kind of other reason other than that's how you just kind of get around. And I suspect it's the same kind of thing in Hong Kong. It's a very dense city. If you're going to try to get from point A to

point B, this may be just the easiest kind of way to get there.

I mean, is that just the motivation of these places? This is just a rational way to kind of get from one place to another, or is there something deeper? Is it carbon in Europe? Is it the economy in Hong Kong? Is there something deeper than that, do you think?

MR. SCHULZE: Well, I think, no, actually. Surveys show that the choice of the transport mode bicycle is done because it's fast, efficient, and cheap. You know, I think people enjoy the side benefits of it, that, yeah, you live longer and you're healthier, but those are not the reasons why you would choose to get on your bike in the morning, so I think it is very much it is the cheapest, fastest, most convenient way of getting around from point A to point B in an efficient way.

So, that's really what's driving that. But, of course, at a city level, you know, if a city is committed to becoming carbon neutral, then it's a good start to get as many people onto modes of transport that don't produce global warming.

So, I think there is a whole range of side effects. So, in Copenhagen, cycling is a political tool and it's a political tool that is used to achieve bigger goals, bigger policy goals, so the bigger policy goals in Copenhagen are a carbon neutral city by 2025 and a healthier city. And the bicycle is one political tool to kind of achieve that mission and the great starting position that Copenhagen has is that even before those political goals were identified, before people really knew what carbon dioxide really is, the bicycle was already kind of well on the way to becoming a main mode of transport.

So, today, our question is not how do we start from scratch. We're already very good at being a walking and cycling environment and how do we become even better than that, that is, of course, one of the -- not quick wins, that would be unfair to say, but it's one of the easy targets.

MR. PUENTES: And I think that's a great lesson for the U.S., and I think that as we're trying to create some of these different modes, it has to be framed as a convenient kind of tool, I think that's the motivation that you'll get from Americans here.

John, in Hong Kong, do you have a similar --

MR. SOLOMON: Oh, I would absolutely echo it. I think to the extent that Hong Kong is a model for urban sustainability, it is one by happenstance only, certainly not by government policy, although, to be fair, I think Hong Kong is becoming much more environmentally conscious as a city, as a government, as a population, largely on account of deteriorating air quality over the past decade.

But if Hong Kongers can pride themselves on one thing about their city, it's urban convenience, and this is a major issue in a city, which is so transaction based. I have a colleague and friend from Los Angeles who said that he was amazed that in Hong Kong he could have seven meetings in a day as opposed to in Los Angeles where at a maximum he could have three just because of the time that it takes to get from one location to another.

Hong Kong is very dense. The geography is tortuous. There is a 100 percent tax on new automobile purchases. Driving in Hong Kong is -- there's really no reason to do it unless you have three children and you need to move them from home to school, et cetera. Taxis are very convenient. Buses are very convenient. In fact, these things start to feed back on one another. Buses are incredibly convenient in Hong Kong, in large part because the population demands this convenience and because there are overlapping and competing bus companies.

This results in an over capacity in bus transit and what we refer to as the bus wall. So, the buses will simply line up, belching emissions, as it were, and they're not at capacity. On the other hand, you can always count on one being there.

MR. PUENTES: And for the U.S., I mean, obviously, even in a place like Portland where transit, very rich, high transit ridership, a high percent of people taking transit to work and different modes, the motivation in a place like that may be a little bit different. I want to ask you something else too on that.

MS. BROWN: Yeah, I wish we could say it was happenstance. That sounds like a lot nicer, but that isn't how it works in general in the United States. If you want to affect change, it will need to be done through policy and changes. As was mentioned before, we have an urban growth boundary, one of the only cities in the United States to do that, very revolutionary. That's a law that passed.

Our streetcar plan is a 20-year plan, already planned out for another, let's say, roughly 40 miles of streetcar system, still planned. Our bicycle plan, 25-year bike plan on how many miles and roads. So, these are very strategic, thought out targets that really have to be supported by, you know, everyone from the state level to the mayor and all the folks on the county government that move it forward.

So, ours is not happenstance and people aren't just taking their bikes because it's easy and convenient and because it's cool on *Portlandia*, there actually is a lot of kind of policy and we try to be the research driven leader in terms of innovation, especially for the United States, because we do know we're behind in a lot of these areas.

So, our stuff is all planned.

MR. SOLOMON: I just want to clarify. Hong Kong is not entirely accidental. It's just that the planning is convenience based and commercial transaction based. It's how to maximize the number of people passing from the train station through the shopping mall to the office, not on how to minimize the amount of carbon being produced, per se.

MR. PUENTES: So, in other words, in Portland, for example, the $3.5 billion, which is a big number, in development attracted the streetcar lines, not because you laid a streetcar line down, it's because of a host of other things that contribute -- of which the streetcar investment is just one.

MS. BROWN: Exactly. Absolutely. And we're a big believer, too, in clusters, so a lot of it has to do with the cluster development and around the areas. We wouldn't be building streetcars there if we already didn't have a rich history of fabrication work from the old shipyard days, so we have metal workers and machinists. I mean, one of the big issues we all have is a workforce issue as well, and so, you know, that's one of the reasons why we locate in Portland, besides that they were the first one to put a streetcar in, they actually have these skills and the talents that we need to be able to build the product nearby.

MR. PUENTES: Is that a problem, you think, throughout the rest of the U.S.? Is there -- one of the reasons maybe we don't have more other than the fact there's maybe not the demand that we used to -- maybe now it's changing. But skills, how much of a role is that?

MS. BROWN: Yeah, skills are a huge role and it's really interesting in the United States because we look a lot, again, to our European and Asian friends where, you know, fabrication and building is considered still a very honorable tradition, and in the United States, you know, that kind of fell away. Manufacturing was decreasing for a while and as most people know, it is back up on the rise and a lot of that has to do with STEM and obviously the investing in education, engineering, the skill sets, the machinists, the laborers that are building these products.

So, I do think it's a big issue in the United States is just starting to re-pay attention to the good work that's been done, for example, overseas, whether it be

Germany or Copenhagen, where they've mirrored skill sets with the actual workforce. It's something that the United States hasn't done quite as well on a global scale.

MR. PUENTES: Interesting. And that's from a manufacturing perspective. But industry in Copenhagen, I mean, what other firms do you work with then? I mean, your firm is providing those kind of services in and around Copenhagen and across the world. What other kind of firms are there in your city that you work with most particularly?

MR. SCHULZE: Well, I think, you know, there is -- I think there is basically -- I think the main lesson for me is that, you know, policy in Copenhagen is matched by an urban culture that has evolved over a long, long time. So, we find ourselves today with a geographic region that is fairly compact. The homes and work places that we're trying to serve are actually in a place that is fairly dense, so we're not finding ourselves in the situation of Jonathan's friend who lives in LA and cannot have more than three meetings a day because there is huge metropolitan regions to span.

So, for me, you know, one of the key lessons in -- one of the key challenges, I think, for transportation in our time here today is that in the North American metropolis, there are entirely different scales of operation to tackle. You find yourself with a different kind of physical city structure, but I think that still allows an opportunity to -- that then means that the streetcar and the bicycle and walking, how those systems meet becomes disproportionately more relevant because all our journeys will be done on the same mode of transport from beginning to end, but that obviously is different in the North American metropolitan region.

But that was sidestepping the question. I guess there is -- yeah, there's a range of firms in Copenhagen that are small, but also the larger engineering companies are very well versed with all of those aspects, but I think it is very similar to other

professional environments in the world as well. So, you know, some -- we benefit -- our company and the companies that we compete with or are friends with, we benefit from a gift that we've been given as a result of an urban evolution over a long period of time and we capitalize on that with varying degrees of self promotion, I would say.

MR. PUENTES: That makes perfect sense. I mean, given, then, your perspectives -- you're in St. Louis, (inaudible) Wash U, what lessons do you think that -- I mean, understanding the scale and the size is different, I mean, are there key lessons like you find in Copenhagen or elsewhere that you think are maybe more transferrable for the United States?

MR. SCHULZE: Definitely, definitely. I mean, I've worked with and I am working with bicycle infrastructure in Los Angeles. I've had the benefit of doing that in San Francisco. I've learned a little bit about that in New York City. And I think maybe you can't overnight just kind of create the perfect bicycle system. Maybe you won't wherever you live the first thing you'll encounter when you hit the street will be a safe cycle track. But you have other problems.

So, the project that I'm working on in Los Angeles is trying to connect downtown Los Angeles with South Los Angeles passing through the Figueroa Corridor, along the UC campus, and the UC campus, for example, has 16,000 bicycles. The bicycle density on the UC campus is higher than Copenhagen. So, you don't have to be a rocket scientist to work out that if you want to connect 16,000 bicycles on a campus with students and faculty with downtown Los Angeles where a lot of these people live, you just need to provide the right infrastructure and you'll have your first constituent user group that will actually take to the system.

And the same system of bicycle infrastructure will actually enable people in South Los Angeles to get on a 20-minute cycle ride to a lot of jobs in downtown Los

Angeles. So, I think you have issues of polarization and a heterogeneous society that works in a very different way, but this infrastructure, I think, could help tackle some of the problems that you have, even though it might only be, you know, serving a kind of a limited segment of the metropolitan region in the first phases.

MR. PUETNES: And based on your comments, and Chandra, what you're talking -- I mean, it does seem -- the intentionality seems to be policy driven, right? I mean, it's kind of setting up kind of public policies, public investments to kind of get these things moving. I was struck by your comment that this is not happening maybe intentionally in the same way. Are these then private sector driven initiatives to keep people circulating throughout the city? Or is it -- I mean, is the government having a role there in this way?

MR. SOLOMON: Absolutely. I would describe them as collaborative. There are only two urban transit companies worldwide that turn an annual profit, they're in Tokyo and they're in Hong Kong, and the MTR Corporation in Hong Kong, the equivalent of the MTA or metro, the subway company, turns a profit because of the development of land above its stations on a very specific model, which feeds people out of the train through retail opportunities at the highest end and at middle and low ends, depending on where you are in the city, and then out into other modes of transportation or even direct pedestrian links into workplaces and residential areas.

And at the same time, the government, via the highways department, is engaged in the kind of filling out of this network -- the construction of footbridges, tunnels, et cetera -- to connect pedestrians who are using the transit system to either places of work or other forms of movement. This is even true at the level of -- I shouldn't say inter, but intra-national movement.

So, you can take the ferry from Macau, pass through the border, get on a

train, get on a ferry, get on a tram or a bus, all through the kind of dispersive medium of a double atrium shopping mall, it's something called Shun Tak Centre in Hong Kong.

So, this is a model which is very much reliant on private investment and its origins are actually in private developers seeking to connect disparate properties in order to increase pedestrian traffic and increase profitability of second level shopping arcades, but it's certainly, at this point, a government planning policy.

So, if you look at new town developments in Hong Kong or even the development of new areas in the city center, you see this model of what's referred to as the podium shopping mall above the rail station with towers above the podium and then with footbridge connections or tunnel connections out to either other podiums or just surrounding areas of older urban fabric, you see that model proliferating now quite widely.

MR. PUENTES: So, I'm going to go to the audience in just a second. I have one more question for Chandra before we do that, and I've focused and been preoccupied on the international lessons, importing those back here to the U.S. I mean, you have kind of a global kind of at least perspective. I mean, do you see things that are happening internationally that you would like to -- that you think would matter for U.S. Maybe it's with the other manufacturing firms. I mean, are there lessons that you would bring back to your firm from around the world?

MS. BROWN: Yeah, there are a lot of lessons and I guess, again, talking about the people side, one of the ones I see the most is the engagement and the community engagement that's done at levels. And obviously the United States is such a diverse and huge country that that makes it more difficult, but when I see, you know, the kind of political and really the people will from a lot of these international cities I visit, the United States, that's what it's going to take to get it done. I mean, Portland's got things

done because they really do have a populous that's behind that and believes in it. But that's a difficult thing.

So, as we sell streetcar systems, for example, across the United States, not everyone is a true believer to start out, and so a lot of the lessons that we take back, we're like, look, here's proof that it's been done, it's been done successfully, take the lessons learned, take the data and the statistics from these countries that have been around many, many hundreds of decades and stuff before we were even formed. Take those lessons and bring them back to our communities in the United States and use that to push our policy forward and become more innovative.

Again, we want to become a better borrower of technologies that have already existed for a very long time and we do believe, you know, the United States still has probably the most productive workforce in the world and we still are great innovators in terms of patents and R&D. So, we need to take the lessons that are already out there and then come back and apply them in our own communities.

MR. PUENTES: That makes a lot of sense. I do think things are changing. I hope there's more optimistic -- kind of, at least my perspective, I think for a long time in this country we did do things the wrong way and it was very siloed, was very -- was the opposite of what we're talking about here today. Hopefully, I think, that things are starting to change.

So, let me go to the audience and see if folks have questions, kind of comments, if you can introduce yourself, kind of, where you're from, and then try to direct one of your questions to one of the panelists, please.

MR. SOUZA: Good morning. Valente Souza from Mexico. Concerning Portland, it's fascinating to many of us who come from other countries that in the states, in fact, for example, Ravine or Irvine, California, when you ask them, where can I take a

bus, they look at you, are you mad? So, is the same with Portland, probably, that the fact that you started the streetcar, the question is, there was no public transpiration before? Because it's very odd that people depend enormously on their car. It's because of the tissue of the city. You don't need public transportation, probably.

MS. BROWN: So, the streetcar was not the first public transportation in Portland. So, they already had a history starting with light rail back in the 1990s and moving that forward. But even, again, that's still very recent for terms when you talk about folks in other countries. So, I would say, you know, biking was always kind of a big culture there. We have one of the highest biking percentages, again, in the United States. So, the biking, the pedestrian, and then this urban growth boundary, again, which is about 20 years old, all those kind of policies pushed people towards taking public transit. And it is really easy.

So, I have to say, our light rail system is fantastic. We're one of the few cities, again, which is rare sometimes in the United States, where you can go right from the airport to your hotel downtown. And then what we did -- so, that's the connector to all the suburbs and major hubs. The streetcar, as I said, is the urban circulator. So, what was great about it is people that had never taken public transit before -- and this isn't just tourists, this is folks within the city who want to, let's say, bar hop -- we have the highest percentage of micro brews per capita, little known fact, and a lot of distilleries -- and so people hop on and off the streetcar. They go to Powell's bookstore and then they go have their beer. So, it actually changed -- the streetcar itself, has created a whole new set of riders, but I don't want them to take total credit.

Again, there's been lots of transportation and public transit throughout the city, you know, over the past 30 years, really.

MR. PUENTES: I know we've picked on LA a lot here, Los Angeles, all

throughout the morning. I mean, Los Angeles also represents a good example of a place that's trying to reinvent itself, trying to make big investments across the transportation network, not just for livability or convenience kind of purposes, but to put people to work in the short-term -- we have a big unemployment problem there now, particularly with construction -- but also to position them as more of a global city to attract firms and to be more globally competitive in the long-term.

So, I think they've recognized that transit and transportation plays a big role in that.

SPEAKER: You focus a lot on public transit --

MR. PUENTES: Your name and affiliation?

MR. SWILLER: Oh, sure. Sam Swiller. I'm a local resident in DC, in the real estate field.

You focused a lot on public transportation today, which we should, but I wanted to know if you've spent any time thinking about the impact of the recent development in cars, whether it's car share programs, electric cars, or even driverless cars and how they're going to impact people transport in the future.

MR. PUETNES: Anyone want to answer? I think this is a good question particularly as it relates to the carbon question here in the United States because we're looking at lots of different ways. I know we've just now -- the new vehicle fleet is as efficient as it's ever been, 25, I think, miles to the gallon for the first time ever. I think that's one big piece that's going to be a part of this.

The good thing about the transportation discussion we've had here has been that it's also integrated into the urban fabric and kind of how these cities are functioning long-term. Folks have things to add to that? Let's go Oliver and then John.

MR. SCHULZE: Well, I think, you know, even if no car on the planet

produced any harmful emissions, I still think that there needs to be an equilibrium of different modes of transport. So, I think we will always want to have access to private, motorized or a private mode of transportation that can take us fairly quickly to a destination that's not along a line of public transportation. That should always be there and it should be one option in the mix.

So, I hope one day that the -- you know, they will be kind of not producing the negative impact on the environment that they do, but it still will be, you know, even if you drive a car that doesn't produce any negative impacts, it's still a different mode of transportation.

So, I still think there is a role for soft modes of transportation -- for walking, for cycling -- because I think they still enable -- I think a city that is good at enabling soft means of transportations won't prevent shopping malls being built, but it will make other forms of retail possible, it will make Main Streets possible.

A city that makes walking and cycling possible won't prevent urban sprawl by definition, but it will actually create environments where you can have other choices of lifestyles which are more urban, be they living, be they working.

So, I think -- I'm not a huge friend of thinking, oh, we'll just have to wait for the engines to get cleaner and then all the problems are solved, because I think there is much greater social impacts as a result of, you know, a kind of mono-functional street culture than just harmful gases.

So, I think that schemes that you referred to like car sharing, mobility on demand, and so on, I think they're great because I think we should also have access to the car when we want to, but it should be -- you should, I think, in the future metropolis, you should have -- the great metropolis will be one where you have a matrix of opportunities to choose from and you're not condemned to just live one way.

MR. SOLOMON: I couldn't agree more. I would only add that it's in inter-modality that transit becomes an economic engine and I -- whether it's the $3.5 billion that the streetcar corridor generates in barhopping alone, I'm sure, no, but the ability to jump on and off of that line and spend money, in Hong Kong, the ability to capture essentially a captive commuter audience for retail, the real question is, how do you get people out of their cars -- in and out of their cars effectively and in and out of other modes of transportation or on and off of their feet in the city?

MR. PUENTES: We have time for maybe one more or two more?

MR. MILLER: Randy Miller. I'm a businessman from Portland. As Chandra has indicated, we sort of have an ethos in Portland around sustainability and alternative transportation, and to improve, sort of, our understanding of how it works in Europe in particular, we undertook a best practices trip to Scandinavia a couple of years ago led by Patricia Chase, who's in this room somewhere, and one thing that really surprised us, what we heard over and over again in various parts of Scandinavia, was that as the community became more affluent, that more and more people were demanding what we have here in the U.S. -- larger lots, bigger houses, and suburban locations, which put more demands on highways and also for infrastructure, which is sort of the antithesis of what you described.

Do you agree with that characterization? And how do you see that playing out?

MR. SCHULZE: Well, it's basic statistics, and that is one of the big paradoxes of our planning culture and our times is that as our standard of living increases, our personal space standards rise. So, even if we build very dense -- I don't know about London and the Olympic site -- but if in Scandinavia -- in Scandinavia, every single person will have 60 square meters of living space surrounding them. I'm sure you

have more in the states, I guess, but 60 square meters is already an increase by a factor of six if you compare it to 100 years ago when we all had 10 square meters of space. Ten square meters is 100 square feet, 60 square meters is 600 square feet.

So, yes, that is one of the big paradoxes of our time, that as we build more dense, we are also -- we're building more and more bricks and mortar, but there's not necessarily more and more people in that. You know, comparatively, our built envelope is getting more and more hollowed out, less and less people live in it, and that's regardless of whether it's a suburban location or if it's an urban location.

The biggest apartments in Copenhagen are right in the city center, and that's -- it seems to be regardless of geographic location whether it's city center or in the suburbs, we will have a similar amount of personal space.

So, it's a problem. You know, if you want to create kind of lively city environments that we often talk about, that is one of the challenges, but I think it means, again, that we need to develop new ways of where do we concentrate life, how do we deal with retail environments and public services in a way that we can concentrate life in certain places and accept that others are less animated as urban environments.

But I don't think that that prevents a sophisticated transportation infrastructure from emerging. I don't think it needs to point towards the future's suburbia. I think those are countering trends. In Copenhagen, we have both the trend that families that have kids want to move out to a place where they have a garden, but at the same time, there's other people that choose the opposite vector, that want to move into the city center. So, both coexist.

MR. PUENTES: And absolutely a big question here for the U.S. going forward. We know this is going to be a major area of focus.

I hate to cut it off, I'm getting the high sign we have to wrap it up now,

and I hate to do that because I know there was a lot more questions. We're going to continue this conversation also with all the other panelists. At the end of the event, we're going to have a reception where we're going to kind of rehash some of these main themes.

Just to kind of touch on a couple of these, already, this whole thing on urban convenience, you know, maybe it's going to be a car in some places, maybe it's going to be a bike, you know, maybe it's not just the role of transportation as it connects to people's lives, I thought it was really important, the role of public policy and how all that intersects with the private sector and how to maybe be different in the U.S. and Europe as it is in Hong Kong, all this around intentionality and the motivation then for why we're putting these things together in the first place. I love this thought on the gift you've been given as your firm, and just what we're seeing as, you know, building these creative, quality, livable places actually has some direct economic benefit for firms and services, maybe some bit about the differences within places, some cities may be outliers compared to the rest of their countries, and I love the idea of a three meeting limit every single day and this brewery tour that we talked about already, I think that that's something we should do.

And so please join me -- thank the panelists.

(Applause)

And as we're getting un-mic'd here, we're going to call up the next panel, which is going to focus on environment and building technologies, I'm very much looking forward to this, which will be led by Christof Jantzen at Washington University Sam Fox School where he is an inaugural professor at the International Center for Advanced Renewable Energy and Sustainability, which has the coolest acronym I've ever seen, I-CARES.

MR. JANTZEN: Thank you very much. So, what we would like to do now is we're switching gears from transportation and modes of transportation to the building scale, and before I start doing some formal introductions of the panel and myself, I just want to frame the topic around this panel discussion that we're starting.

In the year of 2050 it's anticipated that we will have over 30 megacities with populations exceeding 20 million people. At the same time, the built environment in these megacities will increase at an unprecedented rate, and I believe we have seen some very striking images in the earlier presentations. It appears that the optimization of building performance will be a core focus for architects and engineers in the future. A variety of building technology advances have been developed worldwide, so we're able to do the net zero water, net zero energy, the net zero waste building. Those are being developed now, and they're being executed. So, what we are holding for the future are actually carbon-neutral and energy-plus construction types, and those are the labels that will probably mark the next generation of our buildings and our cities, that our buildings that will generate energy instead of using it.

So, this is the topic of this panel discussion where we want to focus on environmental and building technologies, and we want to do this along four individual cities, them being Chicago, Helsinki, São Paulo and Masdar.

But before we do this, I would like to introduce myself. My name is Christof Jantzen. I'm an architect. I have a practice in Los Angeles, and I also have the privilege to be the I-CARES Professor of Practice at Washington University in St. Louis, and I'm part of the International Center for Advanced Renewable Energy and Sustainability which is a university-wide initiative at Wash U.

So, with this I would like to introduce our panel. I think we have a very interesting group of people here. We have an architect. We have an engineer and

scientist, and we have an urban designer and landscape architect, and we have an engineer. So, I think we have an interesting group of people, and we will see a variety of different perspectives along the cities that each of the panelists will be discussing.

But just a few brief words on the person next to me, Gordon Gill. He's a founding partner of Adrian Smith & Gordon Gill Architecture in Chicago. Gordon's work includes the design of the world's first net zero energy skyscraper, which is the Pearl River Tower, and he's also responsible for the world's first large positive energy building, which is the Masdar Headquarters building. I was very intrigued by a publication by Gordon's office called *Towards Zero Carbon*, which is a comprehensive and integrated plan to decarbonize an area in Chicago called The Loop, which is the central corridor in the city center of Chicago. So, I'm sure we're going to hear more about this a little bit later.

Then we have Fabio Mariz Gonclaves from São Paulo. He's an urban designer and landscape architect, and he's also professor for Design and Landscape Architecture at the University of São Paulo. What's interesting about Fabio is for one, the location where he's working and practicing. Probably we'll hear some of the work that he has done with his peers and with his students in the development of new urban strategy as it relates to saving and restoring São Paulo's unique landscape ecosystem biodiversity.

Then we have Erik Olsen from New York. He is a partner at Transsolar Engineering. Transsolar is known for high-performance climate- oriented design solutions. Transsolar has also been involved in the development of the Masdar City Master Plan in Abu Dhabi, and Erik will start talking about this a little bit later. And Masdar City is the first new city development of its kind meant to achieve a carbon-neutral footprint. I also would like to mention that Erik also was a Director of the Green

Building Program with the city of Chicago, so he also brings a unique perspective as it relates to policy and city governance.

And then finally we have Johanna Kirckinen here. She's the Director of the (inaudible) Ecological Sustainability Department at SITRA, and SITRA is the Finnish Innovation Fund. She's a researcher and engineer. I learned that yesterday, and she has a prime focus on advancing the quality of Finland's building environments, and she was responsible between 2009 and 2012 as she directed Finland's new energy program with a strong focus on energy-efficient building strategies. And part of her work, which we hear about a little bit later is the development of the Low2No, a de-carbonization plan of an inner-city block in the city center of Helsinki.

So, let us start with our focus on Chicago. Gordon, your firm's publication *Toward Zero Carbon* which I mentioned is a visionary story about the city of Chicago, the way I read it, to become the greenest in America and a world leader in energy efficiency and reducing carbon emissions. Can you tell us about the vision you have for the city of Chicago?

MR. GILL: Sure. I think I'm going to back up for a second and start with a story that caused us to do that book. Our firm is 6 years old. We started in 2006 and as Christof said, we were pretty lucky to have done some pretty significant building designs, and we continue to do those as architects. The idea behind those buildings is really to improve the quality of the environments within those buildings and around those buildings and the impact that they have. I think what we haven't said yet maybe is the impact that buildings have on carbon emissions, approximately three times worse than automobiles. Although the attention is always there, you see it on TV commercials every day, that little footprint or that little note is not necessarily broadcast at a high level, so,

we occupy them. We live in them. They're everywhere we go, and they're probably the worst things that we could propagate, so guilty as charged.

However, I think that we have a responsibility to improve their performance, specifically their embedded carbon footprint and that manufacturing process that leads us to build them a certain way. And when we started the firm, we got asked to design a net zero hotel in Chicago adjacent to the Sears Tower, what is now called the "littlest tower." We said no because the economics around that particular idea weren't valid, but what we were very interested in was the tower itself, the littlest tower, because it was the same client on the same parcel, we wanted to understand what the existing building could offer the new building. Could we bring the new building online with no impact to the grid and at the same time improve the quality of the existing building? And we proved that we could.

We took 68 million kilowatt hours out of that tower, the equivalent of something like 20,000 single-family homes in the neighborhood around it, and the new building only needed 25 percent of that savings. So, the question was what do we do with the other 75 percent? Where does it go? What's it worth? To the owners? To the city? To Con Ed? What is that savings worth? And we found out rather quickly that it was extremely valuable, not in just of terms of offsetting carbon but in terms of the investments that were being made in those buildings.

So then we started to try to understand how we could expand this idea of systems within a building and look at the city as a whole, not just as parts, but as an integrated, what I call "ecosystem." We have built ourselves probably the most significant barrier reefs ever, and now we're trying to figure out what to do with them.

So, at the time, the city had signed up for the 2030 challenge, reduction of 39 million metric tons of carbon. We wanted to know how to do that. How were we

really going to achieve that in that time? And we didn't understand it, to be honest. We couldn't figure it out, so we decided to do this book. We took 25 people. We took the area called The Loop, which is inside the river and the L tracks downtown, 450 buildings, about 20 million square feet, and we documented every single one of them. We went out. We thermo-imaged them. We categorized them by use, by era. We looked at their facades, how they were built, how the programs had changed. The full gamut of that analysis is in that 280-page document that we published.

And what we found out was that there were no necessarily linear patterns of building behavior. Just because they were nearer doesn't mean they were better. Just because they were older didn't mean they were bad. And what we found was the interconnectedness between all things that come together to make a city were critical in defining the path towards lower carbon. So, the relationship between transit, building density, use -- in our particular case, we have a heavy office core, very little residential. Residential uses about 25percent of the energy that an office building does, so mixed use is very critical. Education and walkability of the downtown core to decrease traffic, and at the end we found out that we could increase density by 50 percent and decrease carbon by 25 percent.

And although these statistics and these numbers all sound like an accounting of how to make things work, the true purpose of what we're trying to do is improve the quality of life in the city. And it is the quality that I think is the most elusive because as far as technology is concerned, you could build a $2 1/2 billion wind farm or $2 billion solar farm and take the entire core off the grid and we wouldn't have touched one single design issue inside that core.

So, what we're finding and what we're most interested in are the things that I think everyone was talking about today is really how we live, how we improve the

quality of our lives, especially for us in our American cities where we're not necessarily looking at increased population and migration. In some cases, they are decreasing, so what do we do with the 97 percent of existing building stock that we have? And the way I look at is to basically tap into the latent potential of that stock, reposition the real estate as a valuable asset through its energy, and then recreate an environment that is not just hopefully a better-policied, better-designed place to live, but an economically viable solution to cities that are not necessarily growing at a rapid rate. I'll leave it with that for now.

MR. JANTZEN: Yeah. To this point that you're making, Gordon, we're all basically striving for a better urban living environment, and I live in Los Angeles. I have a background in Europe, and I also spend time in St. Louis, and all of these urban experiences are quite different.

And Johanna, the way I understand SITRA as a national, government-funded organization trying to pursue strategies that create systemic change in the real estate construction design environment. This is something that will change the entire demographics of the building industry in your country. Maybe you can talk a little bit about Helsinki and what kind of changes this program that you're working in is showing for Helsinki?

MS. KIRKINEN: That's lovely. Thank you. So, my name is Johanna Kirkinen and I work for SITRA as a senior lead and currently, actually, we have fixed-term programs. Currently I'm leading a team and working with a project that we are creating a model that we want to increase this kind of like regional resource efficiencies, so we are moving towards, like, from energy efficiency to a small comprehensive approach.

But a few words about SITRA. So SITRA is actually independent fund. We were established in 1967. It was this kind of like Finland's anniversary gift to itself to

establish a fund that promotes Finland's future and well-being, and currently our vision is that Finland will be a front runner in sustainable wellbeing, and with sustainable wellbeing we mean that all three aspects of sustainable development, so the social, economic, and ecological. It's great that we can be independent, so we are acting, and we have those programs and projects. We are funding them from the interests of our (inaudible) capital. So, last five years, SITRA has been working a lot with energy efficient built environments, so we have been funding a lot of projects. For example, the first zero energy buildings in Finland -- and it's not that easy to do zero energy buildings in Finland (laughter), and also we have been generating tools for energy efficient master planning. We also have a lot of projects with energy efficient renovating, and that's also really not that easy. And also about sustainable lifestyles, and yes, actually Finland, one-third of our energy production is produced with renewable energy, but still we have a really huge carbon footprint. I think the U.S. carbon footprint and Finland's carbon footprint is quite similar level.

And built environment, while we did concentrate on that one because the buildings, construction, and transportation, they actually consist like the 60 percent of energy consumed in Finland, and approximately nearly 60 percent of carbon emission produced. So, built environment really, really has, like, large impact.

And some projects I want to introduce. The one is this Low2No block development in Helsinki. So, some few years ago we put up this kind of international competition. We wanted to choose this kind of like really cross sector and team to develop this kind of a block that would promote sustainable development in all its three aspects. And we chose a team of (inaudible) and they made this kind of like proposal called c_life, City as Living Factory of Ecology, and this proposal especially promoted sustainable lifestyles, so actually when I was telling that okay built environment that it's consuming energy 60 percent and producing emissions, it's actually us who are there

consuming that energy. We are doing the choices and we are driving the car or anything. It's not the buildings who are actually consuming that energy. (Laughter) And actually there are some pictures from that project there, so there was also, like, how the block can actually bring opportunities to, for example, local-produced food. Could there be some kind of like gardening there and some shops that could provide, like, locally and closely produced food? How the transportation would be actually designed that it would actually promote this kind of like the walking and the bicycling? Could there be some kind of like common laundry instead of, like, everybody would have their own washing machine? Could there be some kind of like common sauna instead of like in Finland, unfortunately, like, many people have their own sauna in their apartments, so --

SPEAKER: That's nice. (Laughter)

MS. KIRKINEN: But it's not that ecological. And this project brought up, like, several things that we actually, like, push forward in Finland. One was wood construction because like Finland, there's a lot of wood out there, but we don't use it with buildings that much, unfortunately. We used to in the old days, but then, you know, the concrete came and you know. But wood, yeah, it sequestrates carbon so it would like really, really, like, it would bring a lot of jobs for the rural areas especially, so we actually, like, push forward this kind of like wood construction in Finland. So, at the moment there are like some, like, more than 600 more in apartments made from wood, and they are in planning phase there are more than 7,000 apartments. So, and we also, like, change this kind of like the fire codes for wood buildings as well, so now it's possible to build, like, multi-story wood apartment buildings.

And also with this Low2No block development, when we're making all this kind of like energy analysis, it actually came true that in Finland in the cities we have this district heating, so it's actually the best way to get the energy content out of the fuel.

And actually in Finland we have this climate panel that there are like eight professors from different universities from Finland, and they made statements and they just like put up, like, district heating in cities and it's kind of like densely populated area. It's the best way to produce the heat and power, and actually there is this one picture in the middle that you can see the big power plant in Helsinki, and actually the picture is taken from our office, at the roof of our office, so that's something perhaps like Finland could really help like other cities to work on. But unfortunately we have also lessons to do. For example, in Helsinki we are using coal for heat and power production, but they are currently studying how could we replace the coal with wood chips and pellets, so that's actually in progress.

And also PVs, so in Finland, there's usually this kind of ideas that solar power is not feasible, but actually the solar gain in Finland, it's the same as in northern Germany, but this is also like huge campaigning that we have had to do and a lot of, like, work with doing that that actually like solar is very, very good in Finland as well. But it's kind of like the mindset, like people think, like, no, it's not good. But that's what we have been working, and it's kind of like self-produced energy, and we still are -- what to do with that? And I think that we have a lot to learn from you with that one.

Also, we developed this kind of like smart systems and are developing that how could you better life could follow your carbon footprint and you would better know, like, where does it consist of. And also one development in Helsinki that this Low2No block and sustainable lifestyles put up was kind of like pop-up culture. We have a few times in a year we have this restaurant day, so one day anybody could set up a restaurant. And then you have this kind of like open map, and you can go and see like where to you want to go and you can actually go to somebody's home and they will cook to you. And it's kind of like nice culture around the cities, and they have also this kind of

like cleaning day as well. So, one day you can put up this kind of like flea market next to your apartment and anybody can do it, and it's really like making this kind of like urban living really nice and making like opportunities.

Okay, shortly, two other projects I wanted to talk about. One, like, related to this energy efficient built environment. We had this national action plan called ERA 17, and we are funding that together with the Ministry of Environment and Tekes. That is the Finnish funding agency for technology, and we're actually doing one a year. We invited 30 experts to think about, like, what are the ways and what kind of policies we need in Finland? What kind of actions that we could actually gain that 20 percent carbon reduction by 2020, already in 2017 when it's Finland's 100 anniversary celebration. And they put up a 31 different actions in new buildings, renewable energy in master planning, and education and so on that we can actually do. And the best thing in this action plan is that it's really followed up that we will do those actions.

And then, the next thing that we are doing is this resource efficiency, so I think it's really important even that we're not talking about energy efficiency a lot. I think we need to go towards this more comprehensive approaches, and I think from the -- because economy is also something we're discussing here today, so I think this kind of like resource efficiencies bringing more economic opportunities, and it's mindset that it's like finding opportunities. How can we gain more with less, and I think we need to find tools how to visualize different kind of resource flows in the cities, for example. What? Yes?

SPEAKER: -- what I have to say now. (Laughter)

MR. JANTZEN: Okay. Thank you. Thank you. Well, I think hopefully we can come back to this one point that you were making regarding maybe you can call it government control over how we deal with our environments as a means to control

what's being built in the future. But let's maybe move from Europe to South American and São Paulo. And we know that São Paulo, as we have seen in the earlier pictures -- and I think we don't want to (laughter) really mourn this, but I think there's some very troubling problems that are showing in São Paulo regarding environmental issues as it relates to the ecology and the biodiversity of this very specific location. So, Fabio, I was wondering if you could maybe explain the situation a little bit more in depth, and maybe paint some of the more positive aspects of that. But also, I would be interested in knowing, is São Paulo, in your opinion, unique this way?

MR. GONCLAVES: The description I brought today is to try to understand what public university can do in this contest. Today in Brazil you have more than 270 faculties of architecture. It's too many. We produce a lot of architects with low quality, but a lot of architects. And in Brazil, we don't have just one faculty of landscape design or urban use. For us, in the country, the same professional architect is at the same time urbanist landscape architecture and building project architecture (phonetic). So, you don't have enough time in the graduation (phonetic) to discuss deeply the subject like urban design, landscape design, and what you need to discuss to build better cities and to try to move the society to understand our subjects, our questions.

Today São Paulo is the fourth city in the world in investments. They are receiving a lot of investments, whole country, whole planet. So many different groups are putting money in the city, so the price of the land rises a lot, and we have a very complicated society because the differences between the rich people and the low income people is too big. And when you discuss empty spaces, open spaces in the city, you are trying to fight against the real estate because when there is so empty spaces they -- so the opportunity to build, to make money and to make more buildings and as you, today, I think it was is Oliver who said that buildings not necessary to densify the

city. You can have a lot of buildings but a low-density city, and we have exactly this case in São Paulo. It's a very spread city with a lot of buildings, but it's not that dense a city.

So, we have to discuss with the government because with the spread city, the public policy stimulates they buy cars. We have a lot of car factory. Our last president, Lula, was a worker in car industries, so stimulate all the population to buy their own car. It's a dream. Mostly when you watch TV, most of the advertisement in the TV are trying to invite you to buy cars. You have to buy cars. There's some new buildings in São Paulo which have one apartment, 8 or 10 places to park you cars because they try to limit the use of the cars, establish a kind of (speaking Brazilian). I don't know how to say it in English. You can't use the car if you're -- the number of your car is seven, there's a day you can't use your car, so the rich people bought two cars. (Laughter) It's the Brazilian way to live with this problem.

So, it's very difficult to find places to put the parks, the areas you have to keep open to live with the (inaudible) of the rain because in São Paulo it rains a lot. We have so many floods, so many problems to -- the permeability of the soil is completely lost because we build everywhere. And where the real estate's not working, the slums are occupying. And we have to mix the solution with technical discussion and drawings the project, but the social discussion because on the other hand we are having, thank God; we are living a democracy society.

For us it's not so solved (phonetic) question because about 20 years ago we not electing our president. We are under dictatorial society, so now when each government change, we are trying to live with the new politicians. They don't have a good commitment with the social movements, social groups. And all the social groups, on the other hand, not necessary with the correct facts, the correct words. Most of them are always discussion to solve their problems. They don't have the overview -- they are

not able to understand the problem of the city and most of them prefer to live in the gated communities without poor people next to them. When we try to put the discussion about open space, public spaces, most of them prefer to close the public space just for them. When you buy any magazine about landscape architecture in Brazil, most of the projects was done to gated communities for clubs, for resorts. Not necessary good projects for public spaces as we used to see in Europe, for example. And this discussion, we understand that the university has a challenge to take part of this discussion establishing a network of different schools.

Where our schools started -- our faculty started to create the (inaudible) program in ’72, dimester (phonetic) in ‘80s while the PHG, so most of the professors studied at Falk. Most professors in Brazil studied at Falk, so it’s easy to us to connect the other schools, invited them to take part of these discussions. We made workshops in each one. Today in the network we have almost 30 different cities. We made these workshops in the city inviting the architect which works in the municipality government, federal architects which works with environmental discussions in this city. And the students and the professors of each school to discuss together with some of social movements and try to construct our critical discussion which could contribute to the public policies in that city. We don’t believe that we can find a solution which could be used in different contexts because we have so many cities in almost desert country situation. They don’t have water at all, and in my city there’s too many water. It’s a completely different situation. And there are some cities facing huge (inaudible) problems, even being small cities. Completely different, the problem they face, the solutions they could adopt from the usage. It’s like the São Paulo, Rio de Janeiro, (inaudible), El Salvador. So we make these workshops in each city, and each year we are trying to make huge meeting in one of the cities each year to discuss what each school, which group are

achieving that year. It's a network research group, but maybe in the United States or in other countries it's easy to find groups like that maybe. I don't know, but in Brazil, it's the first group which was working on a national scale, and this group faces a problem that the private schools don't use to do research. They just produce professionals, and sell diplomas. And the public schools have traditional resistance to with discuss real estate. They prefer to do research, results, and a commitment with the investors or politicians.

So, both in our understanding is wrong. We have to conciliate these two situations. We have to produce good professionals, but we have to sit with the mayors and investors to discuss what kind of city we are building, and certainly it's not the city we built now. São Paulo have so many problems. Small cities have big problems, too, and we think that university could help to face these problems establishing these kind of network and permanence (phonetic) discussion groups.

MR. JANTZEN: Thank you. Well, I think we can continue our world tour and maybe go to Abu Dhabi. I think so far we've been talking in the context of existing cities, and Eric might spend a few minutes talking about the master plan for Masdar City and the way the carbon footprint in this project was targeted as one of the prime principle.

MR. OLSEN: Sure. Before I get into Masdar, I first wanted to say how much I'm enjoying the format today. I think there's a lot of non-design professionals in the room, and perhaps you don't appreciate the great challenge we've presented to design professionals to speak without slides or visual aids. It's very interesting.

So, Masdar, if you're not familiar with it, is perhaps the first city, it's a planned city, designed from the beginning to be carbon neutral. And what's personally interesting to me for this project, and for Transsolar as well as a practice, is that as Christof said in the introduction, historically our firm developed working on buildings, and this was the first major project in which we were involved in master planning. In a way,

it's shaped much of how we've evolved our practice in the last 5 years or so to incorporate master planning in our practice, and many of the lessons that we learned here are what we now take and apply to many other projects, so I'd really like to use Masdar only as an example of the process that we believe is really important in applying in all kinds of projects around the world.

The other big part of it being carbon neutral is that it will be, hopefully, perhaps the first livable city, livable urban environment, in Abu Dhabi, not a place that's known for livability where everyone gets in their car and runs from the air-conditioned car to an air-conditioned shopping mall to an air-conditioned home and so on. This is a place that seeks to completely change that relationship with the city.

So, I'd like to start by talking a little bit about that idea of outdoor comfort and how it was accomplished at Masdar, which starts with the actual street design and rather than the huge wide streets that you have in downtown Abu Dhabi, has deliberately very narrow streets with relatively tall buildings relative to street width because in this very hot climate the desire is to keep as much sunlight out of the street as possible so you always have the opportunity to stand in shade and so there's no direct sunlight on the buildings. And that alone has a huge impact on the comfort, together with the design of the street grid itself, to keep wind -- which it can be over 40 degrees C., it's well over 100 degrees Fahrenheit there, out of the street because that's warmer than your body and it will actually warm your body and it's not helpful, and use that wind only at night to ventilate the city to cool the city back down.

And the combination of those two primary measures has already in the small piece that's already built, very effective. It's already measured that compared to downtown Abu Dhabi where we often hear about urban heat island, and that's one of the worst examples in the world, it can be more than 15 degrees C. which is 27 Fahrenheit

warmer than kind of the ambient temperature in downtown. And at Masdar, you're already seeing the reverse where it can regularly be 7 degrees C. less, so it's 13 degrees Fahrenheit less than downtown. That's the sort of approach to thinking about what is the microclimate of this place in a very deliberate way going to be like can result in a reality.

The other big half of that is that the intent is that thinking about this creating fantastic outdoor space carries on. It's what Gordon was already mentioning that of carrying that to indoor space. I really enjoyed in the transportation discussion the idea that bicycling and so on is not doing it for the sake of carbon emissions and energy efficiency, it's because it's more enjoyable and the better thing to do. It's the same with the approach to energy efficiency at Masdar and most good projects that people are doing around the world. It's about creating a better space which is inherently more comfortable and you want to be delightful to occupy and through that you also create something which is very energy efficient, and that's the key to the low carbons approach at Masdar.

It would be impossible to build that city at any kind of economic feasibility and have it be zero carbon if you built business as usual in Abu Dhabi today. The first approach is to have extreme low-reduction energy use, so the design intent for the buildings at Masdar is that they use 80 percent less energy than a typical building built in Abu Dhabi today. And that's often, I feel, especially in the states where we have this perception that you can get there by incremental improvements in technology building the same kind of buildings. We're going to solve it with high-tech glass, better insulation, more efficient of the same kind of mechanical systems, and this is just not the case as it was a dramatically different approach to construction using exterior shading which enables you to completely different types of mechanical systems, and those measures are reinforced by the city design itself. That's another message I want to make sure is

clear is thinking about all of these different scales. It's not just the city scale. It's the relationship of the city scale to the scale of the buildings and what the energy consumption of the buildings will be, and then taking that down even to the experience inside of an unusual space.

But what's unique about Masdar is it focuses not only on the energy consumption of the buildings, but also did include traffic, urban equipment, even water treatment. Basically everything that consumed energy or produces CO^2 in the city -- in that case with the exception of embodied energy because at the time the project was starting, it was just too much to take on to be able to analyze that as well. That's a super-rapidly evolving field.

But coming back to the discussion of energy, only after all of those dramatic energy reductions are done can you then begin to think about what is the right energy source, which is what we always hear the emphasis on. What is the new energy source going to be? Only after those efficiency measures are accomplished can you decide on the source and the case of Masdar, it's PV.

I was really glad that Johanna already mentioned that district energy of all different kinds because usually the process is to choose, decide how low can we go, how efficient can these buildings be? And then, what really impacts the city scale is what will the energy source for this city be? What kind of district energy systems are we going to look at? And if you design those for the buildings you're building today, you'll never be able to afford them. But if you design them for the buildings you plan to build tomorrow, they can become much smaller. It may be that the right energy source is different, and you have to consider what kinds of buildings are we going to build and how it's going to come back to the level of planning. So, those are the big lessons that we learned from Masdar, and since then we've been taking that and applying it to many other places

throughout the world including places like Oman, kind of going broader and broader afield. We worked on the Low2No competition in Helsinki, in Toronto, in Boston, in Dallas, and at different scales that, you know, developments of four blocks, entire neighborhoods, or entire cities.

And the approach is always the same, thinking about how does the intent for the urban form influence access or protection from wind, for comfort indoors and outdoors? How does it affect access to solar energy and/or daylight? And a good example being that if you set height limitations, you still expect density. It's going to result in buildings with big footprints where you bury a lot of people in the center of the buildings and they won't have access to daylight, so simple planning guidelines end up resulting in buildings which will inherently be less delightful and more energy consuming because they don't have access to daylight. And then, looking at the building energy use that could result from those basic planning principles, and then coming back to the larger scale of what the energy supply would be.

This is the last thing that I'd like to highlight is what's missing for me, and we've had varying success in these projects, is that really -- and this is why it's so exciting to be here is the policies for actually implementing these plans because I believe we're not the only ones. Many design professionals see a huge gap between intent and actual implementation, and there's a lot of good plans of people intending to do something and saying this is how it can be done, but the actual path to implementation, whether it's fiscal of how do you actually pay for this, policy-wise or what are the policies to require it? Or for actually for my experience in Chicago, even bureaucratically, who are the people that will understand this plan and make sure it's implemented? It's a huge gap because a lot of the time, planning is only done by planning departments which have relatively non-technical staff. Sorry, speaking from an engineer's perspective, relatively

non-technical staff, and we're talking about a lot of things that are fairly technical, and if we really want to make sure that they're done, then you have to make sure you have technical staff that are able to accomplish those as well. And I think there's a lot of plans where that piece is just not being thought through now.

The very last shout-out that I want to give is just to point out that we're not crazy. That there are other people thinking about this as the new report from *Urban Green* in New York outlining a plan to reduce carbon emissions for New York City by 90 percent by 2050, and it shows this exact same approach; that you have to tackle the buildings and get extreme energy efficiency, something very different from what we see today, is the first piece and then look at the energy supply. And they've done a good job of presenting one vision of what that would be like for New York, so I'll conclude with that.

MR. JANTZEN: Thanks, Erik. Yeah, I think the time is progressing so before we open it up to you to ask questions of our panelists, I just wanted to make one more point, which is also regarding the hurdles and the obstacles that we're experiencing. Like you talked about the policies and the bureaucracy, but I also think that there's a human factor involved, and I have the experience in my practice that you can develop a very advanced, let's say, systems approach to a building, but if the people don't know how to use those systems, the value is reduced probably by half. So, there's also an educational aspect involved that needs to be created to make this work.

I always think it needs to be made more competitive. You know, in L.A. we have a group of architects, and we're all driving the Toyota Prius, not to make any advertising. But it has become a sport to figure out who can be more fuel efficient with the Prius, so you start looking at your little monitor and you starting to figure out how you can be more efficient in your driving habits.

So, with this, I would like to open it up to the audience with questions to our panelists. Any questions? Something back there?

SPEAKER: To the last speaker, how much did you learn from traditional building practices and urban planning practices in that region in your plan?

MR. OLSEN: Actually, the entire narrow-street concept is what is traditional there, so I would say quite a bit. It's really a mixture of old practices when it comes to -- especially form and the urban outdoor experience, that even the piece of Masdar that is built has a wind tower which would be a fairly traditional device, but then application of new technology where it fits with those traditional practices.

SPEAKER: I'd like to pick up on the moderator's point about educating building owners. It seems to me that you can -- and perhaps you can comment on this from your experience. The whole issue of you build a building and it's very energy efficient, and then the owner or tenants will leave lights on or turn on conditioning systems when they're not supposed to. How does one overcome that kind of a barrier?

MR. OLSEN: That's a great question, and maybe Gordon has thoughts on this as well, but I would say first is to create buildings which are inherently low-energy, so that even if you use the building or miss-use the building, you will stay comfortable.

As second point for me, picking up on Christof's point is when it comes to asking people to engage with the building and how do they use it, you have features that you want them to use. I'm personally very interested in, and we see it in a lot of our own work, of expressing that through design so that you create a design which is interesting. This is what Apple's so good at, right, and we don't do this in our buildings at all. You create something which is so interesting and delightful to hold and use and if it's part of the buildings, I want -- here's this shade and I want to go and use that because it's such a great thing. But we don't generally see that in buildings today.

And there is a certain amount of education on the building owner, and especially I would suggest having at least one person and the building owner who really understands all the design intent, and having them communicate on a regular basis with the building occupiers, as well. There's a great study by the Center for a Built Environment at Berkeley on indicator lights for windows that are supposed to tell you when to open your windows for natural ventilation, and the conclusion is everyone ignores them everywhere except for in the buildings where people -- that building management regularly engage with the building occupants and reminds them what they're supposed to be doing.

MR. JANTZEN: And what's another question over here?

SPEAKER: My name is Rumba (phonetic) from the Technical Research Center of Finland. Two of the panelists mentioned district energy applications and Mr. Gill from Chicago, he was looking at 450 buildings or something like that and their interconnectedness. So, I was wondering did you look at that option also?

MR. GILL: Absolutely. Chicago has district cooling, district heating systems throughout the city, so when we look at the entire package of what it takes for a city to perform, it's everything. It's all the different types of renewable or existing -- and I'll pick up on something Christof asked me to mention which I forgot. But transportation, waste, water, open space -- we actually developed a script that we have now used for numerous planning projects that we're doing around the world that help us to determine things like what you're talking about with wind behavior and thermal issues, but also the interrelationships between buildings and people. So, the reflectivity of glass and the thermal aspects of shade and shadow, winter shadows, versus what kind of public spaces are best suited in certain areas.

In Chicago, we have one interesting feature which is a series of tunnels that were underneath the city, existing for decades, used to move coal and things through to the buildings, and we adapted that space for vacuum (inaudible) waste as well, so there is no stone left unturned when you're looking at getting to some of the goals and targets that we're all talking about up here.

MR. JANTZEN: I think we're allowed one more question, I'm hearing, so.

MS. KLEIN: Hi, I'm Indra Klein. I'm a development consultant working primarily with the under-served. With regard to policy and implementation, what suggestions would you give HUD in public/private projects, particularly with multi-purpose buildings?

MR. OLSEN: Me? Or anybody? That's a great question. I've seen many projects that have gone through that system, and I guess I would look at -- that's a big question to answer. I guess I would look at the policy issues that have proven results, and I think this is a very abstract answer maybe, but I find that in many cases investments are being made that are not genuinely -- the intent is right. And the process is there to get to a certain point, but the results don't necessarily yield the original intention of the goal, and I think that follow-through is critical. So, I think that you should look at certain key performance indicators that can drive the KPIs that we had at Masdar when we were doing the work down there, I think you have the targets. You have the goals. And you have some kind of system that ensures that those targets are going to be met, and for us, we called them gateway services. That's what we do for all the master plans that we do because we don't care what people say. What we actually care about is what you're going to do, so at the end of the day we all have plans, but very few are seen to be realized, and I think that's the key.

MR. JANTZEN: Can we have one more question? There's one question over there in the back.

SPEAKER: Hi. In regard to Masdar, I'm assuming the primary source of energy is solar?

MR. OLSEN: Yes.

SPEAKER: But you have complimentary sources. But how are you dealing with the solar storage issues? Or is there just so much sun in Abu Dhabi, they don't --

MR. OLSEN: Masdar is net zero on an annual basis. There's very few -- perhaps no city I know that's planned right now because that's basically an unsolved problem -- that it's disconnected from the grid, so it's still grid connected. However, you have the advantage that, okay, you have night in Abu Dhabi, so you have to make it through the night, but you can -- whereas in many other climates, you have to make it through a net zero on an annual basis. It is perhaps more of net daily basis there, but there is no major storage component.

MR. JANTZEN: Okay, I think this concludes our session for now. I think this topic has a lot of facets and a lot of components that we were not able to discuss today, but I hope that it at least sparked some additional thoughts about the challenges that we face in the future. I would like to thank our panelists. (Applause)

SPEAKER: Thank you Christof and panelists, as well. And thank everyone who spoke this morning. I just want to remind you all we now are at the appointed lunch hour. There's food and drink outside, and you're welcome to take that where you will, but we would like to begin promptly at 1:30, just in 55 minutes from now. We have a panel number 3, Adaptation in Renewal in Shanghai, Mexico City, and New York followed by our second keynote on Ecological Urbanism, and following that there's a

reception. A lot of this day is structured for networking, discussion, informal conversation. Please take advantage of these free moments. We'll see you at 1:30.

(Recess)

SPEAKER: Good afternoon. Good afternoon, and welcome back to The Innovative Metropolis, Part 2. We move forward with one further, a third panel, "Adaptation and Renewal in Shanghai, Mexico City, and New York," followed by our second keynote. And following that, then a reception and respondents discussion. And you'll have other announcements about that, but when we conclude Dean Mostafavi's keynote, we will then move across the hall for that reception and respondent's discussion.

I encourage everyone to keep those tweets, texts, and questions coming throughout the panel discussion and for the keynote, and, as well, for the reception and respondents discussion.

But, for now, I'll turn the proceedings over to our moderator for Panel 3, Michelle Knapik. Michelle is the Director of the Sustainable Environments Program for the Surdna Foundation.

Michelle.

MS. KNAPIK: Well, thank you. And I will say welcome, again, to the afternoon. This is no post-lunch coma session. This is adaptation and renewal.

So, again, yes, Michelle Knapik from the Surdna Foundation. And, really, I just want to say just a note about philanthropy, and the connection to all of this. Surdna is really dedicated to created just and sustainable communities, through three interrelated programs: Sustainable Environments, Strong Local Economies, and Thriving Cultures. And we also aim to tap into the promise of philanthropy by seeking and making bets on those social-change [???? XXXX "passing years?" 00:01:53]. And a lot of that,

we heard this morning. We heard this thread of great emerging urban patterns. And it was punctuated by this notion of infrastructure accelerators -- which is sort of music to my ears, because my portfolio at Surdna is framed around next generation infrastructure.

We heard about sustainable design opportunities. We drilled down into innovative transportation solutions, and built-environment frontiers. And now we're going to pivot to the challenges of adaptation and renewal.

And we know cities have been adapting to changes -- social, economic, environmental -- over many, many years. But where are we now -- right? We've got soaring energy consumption, storm surges and extreme weather events across the globe. We're sort of in uncertain political and global, complex global economic times.

And so how are cities relating their past and current place in time to their futures? How are we adapting? And, really, what is urban design?

So, we've got this amazing cast of characters to help us go through this journey today.

Valente Souza is Director of IQh, basically a hydraulic intelligence. He's an architect and urban designer. He's got extensive experience in public policy in Mexico and beyond, really specializing in land use and water issues. And just in talking with him as we were preparing for this panel, I think he combines this layer of -- well, multiple layers of public policy, innovative design, and community engagement. I think you said to me, the landscape talks to you, and that the new variable in urban design is the environment. And his work is really proof that you can achieve sustainable design in public policy at a grand scale.

And we've got Alex Washburn, who is the Chief Urban Designer for New York City in the planning department. And he's worked in the public and private sector. He's served as a public works advisor to Senator Moynihan. So he's earned his political

striped. And he brings this notion of innovative landscape architecture to New York, and it connects very powerfully with Plan NYC, which is really a set of programs and actions to help the city adapt to climate change. And I think I've read in interviews, where you put a premium on techniques of landscape and an understanding of nature informing 21st century cities. So we look forward to hearing from you.

And then, Seng Kuan is an assistant professor of architecture at Washington University, and he teaches courses in architectural history and urban design. He's got enticing book titles and exhibit titles, like *Architectural Encounters with Essence and Form in Modern China.* And I think my favor is *Metabolism: The City of the Future*. And the one in the works is *On the Thresholds of Spacemaking: Installation Art by Young Japanese Architects*. So, in talking with Seng, I really feel his connection between the edges of modern design and culture. So I think Valente said, as this panel started coming together, that they have lots in common, even though they haven't met.

So now they've met, and so let's listen, this afternoon, to what they hold in common to this sort of opening question to kick it off, and that's to have each of you describe a plan or project in Mexico City, New York, and Shanghai, respectively, that connects the goals of sustainable city and metropolitan economy.

Valente, do you want to get us started?

MR. SOUZA: Thank you. First, the Brookings and the Washington University have done a tremendous job of putting together this panel, where the huge discussions of this century are mainly the topic.

All cities have geographical contexts, and that's where I started to figure this out many years ago, about 30 years ago.

Most of master planning is based on a ratio of population growth to services and utilities. And when I realized that that was the equation, I said, well, this is

like playing Monopoly. It doesn't make much sense if you don't put the occupation of land related to the landscape where this occupation takes place, that it has a geology, it has mountains, it has forests, it has aquifers, it has a number of issues which originally made the settlement of an urban sprawl take place in the first place. And then we forgot about it, because we became imbued in our cars, in our televisions, in our work, and taking the children to school. So we forgot the memory of space.

And, in a sense, this is a very compelling image that has allowed me to convince public officials that they have to redraw. It's like the drawing of where we live has been faded out, and I try to fade it in, in a cinematic fashion.

So you will start to understand that in the case of a very clear landscape, like Mexico City valley, it's in a high plateau valley, 6,000 feet above sea level, surrounded by volcanoes that were being born a million years ago, and that spewed ashes and alluvia over this great basin, and that's what created Mexico City, with its theoretical lakes. They were not lakes, they were marshes. What happens is that, as it was a closed space, it didn't have any source of water except for rainfall. It doesn't drain to the sea, it just stays there. It's a huge cup of water. So, if you forget that, you start to leave the city as a hell, because it gets flooded all the time, because there's no way out.

So the major infrastructure, the most expensive infrastructure that Mexico City has, it's three pipe systems which are 30 feet in diameter, to drain rainfall out of the city. So why we started to do this, because we started to think of city as a flooded area, instead of saying let's use the rain, percolate it, and then use that water for the livelihood of the city.

So that's what we started to do six years ago, thanks to, basically, political leadership by the former mayor of Mexico City, Mr. Ebrard, and Martha Delgado, the Minister of the Environment. They had the vision and the commitment to say we

have to understand where we want to have the city within 40 years, and the first thing we have to start with is by recreating the landscape where we live. We cannot look against the landscape; we have to work with the landscape.

So, what Mexico City did -- I don't know if I'm finding time, you'll tell me --

MS. KNAPIK: Yes, why don't you, like --

MR. SOUZA: What Mexico City did was basically to protect the lands where we can have infiltration into the aquifer, which would create new forest lands that were being eroded and taken over by landscape development -- by, I'm sorry, by real estate development. So we sequestered 4,000 hectares, which is about 7,000 acres of land, away from urban development -- not like a ring-road around London, but as polygons, because of the geography, that are taken out like mini-forests within the city.

And the percolation index of those areas is 1,000 times what it rains. So anything that would rain there would percolate. And that will give us autonomy of water forever, because it rains forever. It rains all the time. In the western side of Mexico City, it rains four times more than in the northern part of the valley. So it's just basic logic that you increase the forest areas there, and then you have a reasonable city that has a microclimate, it has response to the landscape, and you have new parks and new areas where the city can start to live and start to understand their city.

The way we did this was to talk with the people living next to these ravines, and they participated in the master plans that protected these areas. And we'll talk about it further.

MS. KNAPIK: Back to that, yes. I think we'll come back to that. But that's a great illustration of how you, how the public mindset was getting more connected to the physical geography, and some of the interaction --

MR. SOUZA: That was a turning point.

MS. KNAPIK: That's a great, that's an important piece.

Alex, what do you say about New York City?

MR. WASHBURN: Well, I guess first I'd like to say something globally. And it's great to be in a setting like this that Brookings can bring together, that the Sam Fox School can bring together, where a lot of really intelligent people think about a lot of really large-scale problems. But that's in a context of the clock ticking. And Ricky said it this morning: There are certain cities in this world that are growing very, very fast. As an average overall in the world, you know, we're getting 4 million people every two weeks. It's a city the size of Paris every two weeks.

But, of course, it isn't Paris every two weeks. It's people coming to the edges of already established cities, cities that are under prepared with their infrastructure, under prepared with their understanding of how to manage their landscapes, under prepared for how to accommodate this surge in population. And then urban design is the tool that can change those cities.

So I want to talk for a moment about what urban design is, because, really, it's one of the most powerful technologies we have -- whether it is to achieve sustainability, or social justice, or anything else that relates to the form and function of cities.

The first thing to understand is that urban design does not design cities. Urban design designs the tools the build cities. So, we have certain discrete, actionable products that we have to focus all our efforts on every day. These are rules, plans, or pilot projects. And they're used in a much larger context to effect change. And urban designer works at the confluence of politics, finance, and design. You can be the best designer in the world, and if can't do it under the pressure of politics, under the economic demands, the quarterly demands of finance, you can't do urban design.

So, who is an urban designer? I'm an urban designer. I'm an architect. I draw very well. I wear black. But my role models are not architects. In New York City, where I'm the Chief Urban Designer, my role models are actually three people. The first one is Frederick Law Olmsted -- okay? Olmsted was a landscape architect, and he could draw. But his life's work -- which fosters a change in American cities across the country -- was to provide New York City with an oasis, Central Park.

And it's a fascinating history. You know, when the commissioners in 1811 made a plan for New York, the great grid going up Manhattan, they didn't have Central Park. Their idea was if you wanted open space, you would go to the shores, the shores of these great rivers that we had, the East River, the Hudson, and there you could recreate. Well, the invention of the steam engine rendered that moot, because now boats could tie up all along the shores of Manhattan, so by the 1850s, there was nowhere to go for peace and quiet and to enjoy nature, except maybe a cemetery.

Olmsted changed all that, and he changed it with nature. He inserted nature into the heart of a metropolis, and changed everything.

My second hero from New York is Robert Moses. Moses started as a parks commissioner, and many of his early works, you know, we look on as just models of good government, and making playgrounds for children, uncrowding neighborhoods of New York. Well, of course, through his very, very long career, where he very politically astutely agglomerated titles to himself -- he never resigned from anything. He started out as parks commissioner -- eh, throw in the head of tunnels and bridges, throw in this. By the end of his career -- I used to work for Senator Moynihan, which you mentioned. Senator Moynihan used to work for Governor Harriman. He was his briefcase carrier. And Moses worked with Harriman -- I won't say he worked "for." And Senator Moynihan used to tell me of these meetings, where they would go into a room, Moses would be

there, and he would simply hand the Governor a manilla envelope with a list of projects written in pencil as to what he wanted funding for. The Governor took it, and that was that. That was the extent of planning at the apogee of Moses' career.

Well, my third and final hero is the woman who took down Moses, Jane Jacobs. And it was after the threat of Moses' building a highway through her neighborhood of Greenwich Village that she organized, confronted, and met him. And she was an advocate for the quality of public life in public space, for the fine grain of a neighborhood -- where she lived, her friends lived, her children grew up.

And she was able to stop Moses. She didn't defeat him -- I think that's important to understand -- but she stopped him. And she set off a chain reaction that we operate under to this day, where this is a balance of top-down planning in New York, and bottom-up planning. And you can see this echoed in our legal framework, called the Uniform Land Use Review Process. It is a clock. When a project starts, it goes through, with a sort of a conga-line, because it meanders through this seven-month period where community groups can have their say, borough presidents can have their say. And, ultimately, nothing that comes into the process leaves just as it started, but it is kind of a living legacy of that Moses-Jacobs interaction.

So, I know we're limited for time here, too, but every major project that happens in New York has to satisfy those three.

My favorite recent project is the High Line, which -- have you all been to the High Line? Have you all seen the neighborhood around it, how it's grown? The High Line was $100 million of public funds, it's resulted in $2 billion of private investment.

Moses would have been amazed that it was started by two local community guys, Josh and Rob, forming the Friends of the High Line. Jacobs would be amazed that government could have gotten it right, that we could have done a planning

framework that would very carefully harness that economic development that occurred as a result of the public investment in the park, and shape it into certain envelopes of buildings that would preserve the light and the air to the park, and keep it a place of beauty throughout its time. And then, finally, I think Olmsted would be very please with a walk down the High Line. It's like a ramble through Central Park, except it's 20 feet in the air.

And, so, I just want to use that as a paradigm for what I think successful urban design has to be in the 21st century. You've got to have the quantity of Moses, the quality of Jacobs, and you have to do it with the technique of nature that Olmsted understood better than anyone.

MS. KNAPIK: I love that, Alex. And I love that you took us through the history of Mexico City, in terms of the scaffolding of urban design tools. Because we're about to turn to Seng, who's actually an architectural historian. So that sounds like a good passing of the baton.

MR. KUAN: Thank you very much.

So, as an architectural historian, I would only be true to my métier for me to try to contextualize some of things that have been happening to Shanghai's mobility, sustainability, and urban growth in these historical terms. Some of the speakers this morning have mentioned, in terms of this DNA of the city, or the culture of the city generally, sort of the sense of the (inaudible).

So, the one image I'm allowed to show -- I'm sorry, it's not bigger than it is -- is a display of layers, two, of the underlying structures of the city. One layer outlines the basic network of Shanghai's metro system, and the other layer, a series of colored dots, are the major urban nodes that have been actually instituted by the government of Shanghai as the sort of overarching strategy in terms of urban growth and expansion.

So, the urban structure suggested, represented by the colored dots -- actually, we see on the screen, it's supposed to suggest, you should take my word for it, a clear hierarchy. The 2001 master plan for the City of Shanghai calls for the so-called 1-9-6-6 framework regime, which stands for 1 center, 9 new cities, 16 new towns, and 600 new villages.

This hierarchical system has its origins in the pre-war plan for Shanghai, actually drawn just months after the end of World War II, by an international team of planners, engineers, and architects, many of whom were educated in Germany and the U.K. And we obviously see this hierarchical, the hierarchical structure reflecting some of the recent ideas coming in from Germany and the U.K., for instance, the work of Walter Christaller, the urban geographer, and the British planner, Sir Patrick Abercrombie who was, of course, the father of the green belt, and also the new town movement.

It was actually this model, first promulgated more than 60 years ago, that the government of Shanghai's successive regimes, despite change of governments, that it has continued to update and to promote as the main strategy to remedy the issues of congestion and density in what is obviously China's largest metropolitan area.

The second historical artifact is the metro system, itself --and calling it as a historical artifact, even though it is not very old, at all. But the first line in Shanghai's vast network of subways opened not even 20 years ago. It opened in 1995. And in the next 13, 15 years, it has grown into a vast network of 13 lines, more than 300 stations, 510 kilometers of railway track, 8 million users use it on a daily basis, accounting for 43 percent -- so, almost half -- of the total movement in the city on a daily basis.

And because of the financial crisis of 2008, an additional $30 billion U.S. has been put into further expansion of Shanghai's metro system, which will yield a virtual

doubling of the network, from here to almost 1,000 kilometers of railway track by 2020. So far, so good.

But, so, when we look at the two artifacts together, layered one on top of the other, a very different picture emerges. The metro network does, obviously, a very good job of connecting these various dots to one another, but you don't actually get the sense that there is a sort of correspondence to this sense of hierarchy that the 1-9-6-6 framework. Shanghai's metro system is actually flat. Each line is essentially a duplication of one another, bisecting the metropolitan area from one end to the other, and with stations evenly spaced at regular intervals. In other words, Shanghai's transportation system, however heroic and commendable it is, surprisingly, has not been working in a more complementary way to the city's vision of its urban structure. Not much attention has been given to the idea of mobility at the local level, the last mile, so to speak, connecting the train stations to the actual destinations themselves.

I'm actually particularly drawn to the comment made by my colleague Oliver Schulze earlier this morning, this idea of slow transport versus fast transports, for instance -- how to navigate the vast distances, again the scale that we're talking about, the radius from the center of Shanghai to some of these outer, outlying new towns, this 30, 40 miles. So that even the faster of the commuter rail takes almost upwards of 45 minutes or an hour to get through the city -- the kind of stratification of different modes of transportation, if it makes sense to have a clear correspondence between these two visions of the city.

MS. KNAPIK: Well, that's very interesting. It almost weaves together that notion of was there a missing piece of the bottom-up on that last connector mile piece, versus the top-down, and some earlier comments.

But, I know -- so, let's go back to that notion of bottom-up, top-down. And, Valente, you talked to me a little bit about the master planning process in Mexico City, and how it really became to be something that was -- here's a government vehicle, but it's really owned and driven by the people.

Can you talk a little bit more about how that has come into being?

MR. SOUZA: Yes, this has to do with how public policy is done in Mexico. You have laws that were implemented in the early '90s, it's called the federal law, the National Law of Environmental Impact. And that law, by its design, has, obviously, federal budgets attributed what the law calls for. But no one had done any projects that would sequester or request that money from the federal government.

So what we thought was we have to do workshops with the people that live in the surrounding areas of these ravines, which represent about 6,000 acres of land, in order for them to understand why we're doing the master plan, and for them to put input into the master plan itself. So we did these large maps in relief, there are 1,000 to 3,000. And we projected the city on these ravines, so people would know where they lived in that particular territory.

And then we did a methodology of saying, we are going to evaluate, give a value, of how you invest over the years in the improvement of these ravines -- no? So, as it is an environmental-value area, we had to give a value. And people would put pins on these territories, saying, "We have waste disposal on this point," "We have an erosion of land in this area," "We have the loss of forest in this one," et cetera, et cetera. And that created a local database that is brought into a geographical information system.

And we did, from our end, from my office, with hydrologists, geologists, botanists, ornithologists, a number of experts in earth sciences, we did multi-tasking and multidisciplinary workshops, in order to bring in all the scientific data, put it together

among the experts, and then criss-cross it with the people that live in the territory. And that created, basically, the policies of the master plan.

Once this master plan was finished, instead of giving it to the government -- of course, it was given to the Ministry of the Environment but, politically speaking, we gave it to the people, to the organizations. So when the borough presidents were elected, they would bring the master plans to the borough elected officials, and say: This is what you have to do for the next three years -- and then the next one, and then the next one, because this is a 25-year plan.

Once you have the master plan, going back to the legal guidelines of the LEHEPA, they can call in their representative elected to the senate and to the House of Commons, to the congressman, and say, we have this master plan. You can take out the monies that are already branded for these projects, because we already have a project. No one had done that before. There was basically budgets that were never requested for, and they would go back to the treasury year after year. And now we have, like, $30 million per year to invest in this, and that will bring the cost of bringing water into Mexico City at .07 cents per cubic meter, instead of $3.00 per cubic meter, which is the cost of pumping the water now.

So, the turning around of how you do public policy was thanks to the implementation of workshops with the people, and understanding where the city is. We have a geology that allows that. If you live in a completely -- in New York, which is basically granite, then you have a completely system. You have the Croton system, which requires the forest around it to trickle down the water because there are no rivers. There has basically been truculated -- how you say? -- it's been compressed by the retiring ice 10,000 years ago, and that created the lakes of the Croton system. So you have a completely different policy to administer your water supply.

But, each geography has its own solutions. And that's basically what you have to understand. And the people who live in a particular territory, they have to rediscover where they live. And that's why we did this large-scale maps in relief, and then project them to understand where they lived in relation to the others.

MS. KNAPIK: And I also love the element that you shared with me, that there's a piece of that that's almost like a simulator, like. So if you show an action to be taken, and the investment to be made, it sort of shows out over time the impact of that. So I thought that was great, as well.

MR. SOUZA: Correct.

MS. KNAPIK: And it was just --

MR. WASHBURN: You know, that's actually an interesting point, because the same environmental law that is giving you funding in Mexico is inadvertently, here in America, keeping us from doing many projects. And, again, I'm not a lawyer, so this isn't my area of expertise, but I see it in the timeline and in the tenuousness of major projects that I work on, that because of the requirements to get a finding of "no significant impact" from your projects, you open yourself up to a period of litigation which can often prove fatal to a project.

I just want to bring this up -- and, here, I have to state that this is my view, personally, and I'm not saying the view, official policy of the City or any other branch of government that I work for.

But we have to come from a background where we think of the environment as something to be protected from us, instead get to an environment where we think of the environment as something to be managed by us. You know, it goes both ways. I live in Red Hook, Brooklyn. Hurricane Sandy flooded my house. I love nature. I want to use it in any way I can. But I felt its effects.

And I want to be able to undertake projects, at the building scale, at the neighborhood scale, whose explicit purpose is to work with nature, countering certain of its forces that make my life more difficult, but enabling other ecologies to also grow. Essentially, it's to open up an era of change. And I go back to urban design as a tool of change.

But part of that, underlying it, is a legal framework that has to adapt to the new needs of adaptation -- right? We have to come into an era where we manage nature, as much as we protect it.

MS. KNAPIK: Well, that's very interesting. I was actually, I was going to ask you what your most fresh memory of the impacts of Sandy were, and I think you already answered that one.

But, translate that into your role in the planning department, and where do you take that now, in that sense of adapting tools, and finance, and law. And what's the one next thing you think you can do?

MR. WASHBURN: Okay, it's a super complex problem. It really is this sort of adapting our cities to climate change that has already occurred -- in fact, it's probably worth a quick definition here of "sustainability." We use that term very, very loosely.

But in "sustainability," in the ecological sense, there's mitigation, which is the efforts we do to reduce carbon outputs, which will hopefully help climate change in the future. But there's also adaptation, which are the measures we have to take today for changes that have already occurred. So, making our buildings heat and cool more efficiently, that's mitigation. But doing something to protect my house from next year's storm, that's adaptation.

So you can do that at three levels. You can do it at the building scale, where I could do something as simple as moving my electrical meters out of the basement and onto the first floor. As simple -- have any one of you tried to work with ConEdison? Just to do that simple task is incredibly difficult. We recently, just a couple weeks ago, suspended certain, through executive orders, certain aspects of zoning, to allow people to raise their houses, if they were rebuilding, with a new measuring point -- because we have limits on heights in different districts. Just to figure out, and to imagine the implications that would have is a huge process within a city.

Now, that's just at the building scale. What about at the regional scale? Well, the streets, of course, is at a neighborhood scale. What can we do? Can we do anything with polders? Can we do anything with marshes? Let's say, for instance, Red Hook -- again, a coastal city, where we used to build ships in the 19th century. Wouldn't it be great if we could slow the lateral velocity of incoming waves by planting oyster beds, and small reefs offshore?

Do you know what the environmental impact statement for that looks like?

And then the big-ticket items -- what about floodgates? You know, the Thames has the Thames Barrage, which is in use constantly, and saving London billions of pounds in the protection that it gives.

New York has a much more complex hydrology. But there may be a role for these large-scale regional, almost national projects. They also have their own financing pathways, their own environmental impact statements, their own constituencies. If someone is protected from floods, does that mean someone else gets the water? How do you figure that out?

So, really, it eventually comes down to a form of leadership -- whether it can come from the community level, like the High Line did, or whether it has to come from President Obama, I don't know. But of the three forces, politics, finance, and design, politics is the most powerful.

MS. KNAPIK: That's a great point. I think I have learned, when you ask a designer a question, you get layers of responses. I love that. It's rich, it's a rich fabric.

But, Valente, I think I was interrupting you at one point. You wanted to --

MR. SOUZA: No, on the contrary. I was interrupting.

No, rather than managing nature, the approach, I think, even though it sounds poetic, we have to reestablish the conversation with nature. We have a monologue, because nature is there. But, conceptually, we have to reestablish that conversation.

I was invited to a TED conference, and I, I mean, as it was a TED conference, I said okay, and I talked about that we had to rethink our understanding of how we go about life with the ethics of water. If we think as if a water drop, then we start to understand, in personalizing what water does in the hydrological system, that the water has a right to fall on a forest, to trickle down into the marsh, to percolate into the rock, to run through a river without being asphyxiated by pollutants, et cetera, et cetera. So, if you put your mind into that conversation, you start to have a completely different approach to how you deal with nature.

And nature, by definition, is the greatest teacher, because it's a complex system. And you mentioned the concept of adaptation. Nature is basically the most complex engineering system in the world. And if you understand what it does -- I mean, it makes me cry. A tree --

MR. WASHBURN: Nature makes cry sometimes, too.

MR. SOUZA: A tree has this area of occupancy in a landscape, but it has hectares of foliar area. So that's what engineering is. And besides that, it transforms solar energy into sugars and structures of 200 tons. So there's -- that's engineering.

And if we start to see how we can build roads, systems, et cetera, we can take a lot of lessons from nature -- not in a poetic sense, we can look a lot on how that conversation can reestablish.

And so if we allow nature to be within our cities, we can be living in a city that has densities, like high-rise buildings in Shanghai, et cetera, et cetera, or New York City.

MR. WASHBURN: Absolutely. And I wanted to take that one --

MS. KNAPIK: Quickly, though, because I want to get Seng's --

MR. WASHBURN: Scale. Nature is scalable.

MR. SOUZA: Exactly.

MR. WASHBURN: And even poetically, in terms of beauty, you know, the beauty of a forest isn't compromised by the multiplicity of leaves. It's beautiful at all scales.

But in a city, what we're finding now is that we can gain almost the same advantages of a new large park by simply planting a million new street trees. So, add up together all the net positive effects of the 5-foot by 8-foot tree pits times a million, and you get the results that you would have otherwise had to get by making a major, major land investment.

MS. KNAPIK: That's a great point about adaptation --

MR. WASHBURN: So, these --

MS. KNAPIK: -- and [inaudible).

MR. WASHBURN: -- adaptations, nature is wonderfully scalable.

MR. SOUZA: It's two trees per car, in carbon sequestration. It's nothing.

MS. KNAPIK: Right.

MR. SOUZA: Two trees per car, per day. That's an equation.

MS. KNAPIK: That's a great point.

So, I love two other things here, the notion of crying, because we get connected to something that's -- this is driven by passion, you can tell, like how we live in our cities, how we want our cities to perform. It is about connecting mind and heart in so many ways.

And, Seng, I know you deal on sort of, in design and culture, but I also heard you say something, in our conversation, that there's an issue of governance; that the management of cities needs to be rethought.

And I'm wondering if you could reflect on sort of that -- the management needs to be rethought, and we have relate design to cultural expression.

MR. KUAN: Sure. So, obviously, things work a little bit differently than they do in New York City. Public consultation, to the extent that we're starting to see them in places like Shanghai, operates, though, unfortunately, in a more perfunctory manner. Perhaps it's closer to the Robert Moses way of doing things than what's been happening more recently.

In the case of Shanghai, this two-layer structure of the metro system, versus the new town structure, one thing I just thought of is the first subway line in Shanghai opened in 1995. That was just about the same time when the housing sector in China, especially in Shanghai, became marketized -- from dormitories for workers and work units in the Chinese planned economic system, to the private market.

While 15 years may not be, 18 years may not be a very long time in the construction of subway networks, it is a fairly substantial period of time for the private

housing market in Shanghai to emerge. And when we sort of contextualize this in, still, the Chinese land-ownership system, where the state still is the sole owner of land and, let's say, operator of land, has serious ramifications when we look at the distribution of the city, where the housing stock is being constructed. And, again, this issue of whether or not the new construction actually comports to the official vision of the city, versus how they actually have evolved with the construction of the railway system.

So, for better or for worse, you know, looking at empirical evidence, we see Shanghai still following, more or less, this conic model, with the city center the densest, where it tapers off, actually fairly dramatically, toward the periphery -- except for two or three isolated pockets where they had fairly longstanding centers of employment, for instance university towns, steel plants, petrochemical plants, and these have been, you know, around for quite some time.

MS. KNAPIK: Yes -- no, that's really interesting.

And, so, we've got maybe a little less than 15 minutes to go, and I do want to open it up to your questions for this panel.

But I'm curious whether you have questions of each other, given the different perspectives that you've brought, even though you've got a lot in common?

MR. SOUZA: It's not fair.

MS. KNAPIK: We have time afterwards.

MR. WASHBURN: We should hear from --

MS. KNAPIK: Let's open it up for Q&A.

We've got somebody way in the back.

SPEAKER: My question is, in planning in the America, the existing land subdivision pattern has a huge impact on subsequent design, once the land's platted.

In China, you've gone through your first cycle here, but if you have one property owner, conceivably those property line are much less tangible. They can be moved.

And I'm wondering if that's going to open up greater opportunities for reuse and revisioning properties, unlike here, where the existing property locks in very specific land uses?

MR. WASHBURN: Yes, it's a question about China. I know the New York answer.

MR. KUAN: As far as I can tell, first of all, private land ownership, private-owned usership, I should say, really has been only around for not even a generation. It's certainly within a generation of the lifespan of a building, a reinforced concrete building. And, as far as you can tell, zoning codes in China operate in a very, very, actually, in a different way than they do here in the U.S., where use, actually the building itself is prescribed to adhere to, at least on paper, in a much stricter way than they are in the U.S.

I think, probably in the next 5, 10 years, we will begin to see how a secondary market might emerge in the renewal and (inaudible) of these buildings. But it's still something we're not having a very clear picture of, yet.

SPEAKER: Still too early to tell.

MR. KUAN: Right. Yes.

MS. KNAPIK: Go ahead.

MR. WASHBURN: The New York example I wanted to cite was the New York City block, 200 by 800 -- okay? That was laid out 1811, was the decision. It's managed to have land uses and densities as diverse as, within three blocks of each other, Empire State Building, and a beautiful set of Chelsea row houses.

I think if there's any issue with the Chinese model, it's less perhaps the land platting than the road distancing. And going to a kilometer grid, with very wide roads, I think that's going to be the main hurdle to overcome. Because within any block, any city block, we've found that you can change a zoning lot configuration, and the platting of individual lots, as long as it's within a block.

So the size and configuration of your block is probably the most important decision a new city can make.

MR. SOUZA: in terms of sustainability, which is the purpose of this conference, in the case of Mexico, you have the Ministry of Housing and Land Use, and the Ministry of the Environment. One of the big hurdles that we have is to blend the master plans of the environmental planning with the land use. Because land use is not urban planning, it's basically retail and land selling and speculation.

So we are doing that -- that's the next phase, to blend the kind of city we want within 20 years, instead of being driven solely by land use. It's a huge discussion.

MS. KNAPIK: I know we had a question waiting in the back.

MS. HYNES: Hi, I'm Mary Ellen Hynes, and I'm a geotechnical earthquake engineer, and geotechnical earthquake engineers always study Mexico City. And we are taught that Mexico City is sort of a bowl full of jelly -- the jelly is the clay that fills the crater. So, I'm delighted to hear that there are porous materials through which you can percolate water.

I have two parts: One part is: did you have to sort of add to the porous materials so you had a place where you could percolate down to the aquifers?

And, learning from what you've learned so far, do you have any recommendations for the United States, where we have -- where we are facing an increasing challenge to deal with more frequent extreme storms that give us a lot of flood water and storm surge, and increasing periods of drought? So, we do not have a national plan to manage our water so we can take that flood water and now put it where we have our drought in an effective manner.

So, one, did you have to add to the percolation capability in Mexico City? And what recommendations do you have for the United States to manage its water resources?

MR. SOUZA: A very kind and humbling question.

In the case of the volcanic ring that surrounds Mexico City, by its geology, it's basically a very porous rock. We did the testing of soil with our geologists and we have, as I said before, 1,000 times the capacity we filtrate of whatever rains there. So it's just a matter of slowing down and amorticizing the impact of the raindrop when it falls, and it has to come into a layer of underforest to have time for it to trickle down. That's all we need to do.

Initially, we were going to use geotextiles and a number of (inaudible) membranes to prevent the initial erosion, seeding it with local grasslands, which is

mullelgherbia, which is a large grass that has this form, and it has deep roots, and it will break the soil, again, for it to, the first layer to become porous again. And then just under 20, 30 centimeters, you have, the percolation is there.

So that's why forests are so important. And in the case of the mid-tropical forest of Mexico, we have 400 varieties of conifers, and a number of oaks. It's a very generous ecosystem.

In the case of the -- you cannot call it, in the sense of the United States, but each region has its particular studies that have to be done, and its geology has its particular conditions, if it's non-permeable, yes, permeable volcanic, glacial -- all sorts of conditions.

You have to probably reestablish the conversation with nature, as I said before, and understand that it is the landscape that will tell you the way. It's not that you have to go back to how it was, and become Yosemite Park all over the place, but you have to understand the borderlines between the urban sprawl and the beginning of the natural habitat. If you understand that frontier, than you'll do the master planning and regulations, and planning long term, that will reestablish nature. Once you protect it, you can have the lions' coming back again, and the wildebeests' coming back again. If you don't protect them, and you're always regulating their extinction, they will go extinct.

You need to give them breathing space, let's say, to those areas.

What you were talking about, the oyster beds to protect sort of like mangroves frontier in the coastline of the eastern United States, is the only way, probably, to start to create a frontier that eventually will tell you if it's going to work or not. You cannot do large infrastructures in New York, because you have a river coming down from one end, which is a fjord all the way up to West Point, and you have the sea coming from the other end. The tidal waves, you can't control them. It's impossible.

So, you have to move population inland, probably -- (laugher) -- yes, you will. I mean, you will. You cannot put them on sticks. Eventually, you'll do that. You'll start to become, make like a nautileous city in the frontier, that it starts to move backwards, backwards, backwards. And the new building of the coastline will have to be 5 miles, 10 miles inland -- the new building. And the early building, it will, I mean, it will take you to five years more to get another event like Sandy, but you'll get it. We're all going to get it. I mean, the trend is like that. Mexico City is going to have more rain every year for the next 20 years. And the same is going to happen with the Northern Atlantic.

MS. KNAPIK: It is a huge --

MR. SOUZA: You'll have more moisture.

MS. KNAPIK: -- challenge, Valente.

I want to -- we've got just a couple minutes, and I know we have a burning question.

SPEAKER: Alex, a question about New York. I loved your redefinition of urban design, as the design of tools, not of bollards -- which I think is interesting. And most people would disagree, but I think you're right.

Thinking of the future of the city and its sustainability at all levels, what have you and Amanda Burden been able to do, which is promote the jobs, as a designer, as a design chief? Because, often, that's sort of divided up -- given that we're at Brookings, and Amy was going to ask this question anyway. I thought I'd get there first.

But what do you think you've done which has changed the profile of the city's job market, and where it happens?

MR. WASHBURN: Okay, again, a slightly layered answer.

The first one, where it happens -- we made a very conscious decision in the strategic plan for the city to create new business districts outside of Manhattan. It's one of Mayor Bloomberg's biggest legacies, is that he has brought economic development around to all the boroughs. So we have, now, in various areas that we've re-zoned to permit the sort of building that is needed for jobs, in Queens, in downtown Brooklyn. Now we're even doing things like the -- it's going to be rather large, the Cornell University and Technion University plan for the high-tech campus.

So there are very explicit decisions to locate areas of growth for jobs, support that with transportation, with zoning, and with targeted public investments through the various agencies of the city. That's the technical approach.

But there's also a qualitative approach, and that's one reason why urban design exists as a discipline within the Bloomberg administration. Mayor Bloomberg believes cities compete on quality, on quality of life. And it's a global competition.

So, Amanda, I think, has very successfully put forward this notion that to improve the quality of public life, improve the quality of public space. And working with Jeanette, and others at transportation --

SPEAKER: Well, when do the jobs come --

MR. WASHBURN: Well, the jobs come in -- we compete globally for many of those jobs. Many people come to New York because that's where they want to be. And being here, yes, they create jobs, they look for jobs.

So, the city -- in other words, your city will have a hard time attracting jobs, if it doesn't attract people. So its attractiveness to people is absolutely important.

And then there are other -- Economic Development Corporation, others who work very specifically in a field that's not mine, but in working with business and the

mechanics of understanding, you know, the various requirements through taxation, through, you know, job sourcing, infrastructure for communications, et cetera.

So, the only point that I want to make is that it's a very conscious effort to attract and build on our jobs base, but it also has the side of it which is to make the city more attractive globally.

So, you know, we're hoping that many people who might otherwise go to London might come to New York. And, similarly, Shanghai is in competition with New York for certain industries and certain people.

MS. KNAPIK: Well, this has been a terrific panel. And I love that a conversation about adaption and renewal was really grounded in history, and these layers of, you know, not -- like having this memory of space, and reconnection, as we look forward to renewal. So, thank you all for that.

And I just -- we're going to move into the last keynote of the afternoon, about "Ecological Urbanism." But before I bring up Bruce Lindsey, I just want to thank this terrific panel. (Applause.)

And we're going to get un-mic'd. But Bruce is going to come up. And Bruce Lindsey is the E. Desmond Lee Professor for Community Collaboration, and the Dean of the Graduate School of Architecture and Urban Design at Washington University.

MR. LINDSEY: Thank you very much, Michelle. And I have the distinct pleasure of introducing our speaker this afternoon. But before I do that, and along with my colleagues from St. Louis, I want to say how great it is to be here in Washington, D.C., and a part of a reconnection of sorts of both the Brookings Institution but also our two cities of St. Louis and Washington, D.C.

I also want to say hello to my colleagues and our students back home in

St. Louis. We're streaming live, and we're very excited that they're listening in on today's amazing conversations. I also wanted to mention that in many ways this event here today started for us back in November with the university symposium on sustainable cities. It was opened days after Sandy hit lower Manhattan by Bill McKibben, and he gave us a very moving example of his work as an early writer for *The New Yorker* traveling the subway stops of lower Manhattan and seeing those photographs of that amazing event happen and reminding us that he had written a book on climate change 25 years ago -- a pretty amazing event.

That same week, or in fact, a week later after the university symposium, we celebrated the 50th anniversary of our urban design program with a symposium entitled "Urbanism: Sustainable Cities for One Planet." John and our colleagues and students welcomed urban designers and planners from all over the world to talk about some of the same things that we're talking about here today and also celebrating the fact that our urban design program, one of the oldest in the country, has been educating students and those people are out working around the world on some of the very topics that we're talking about today.

And then, of course, here today at Brookings, and no one better to set the context for our discussions this afternoon than Dean Mohsen Mostafavi. Of course, Mohsen is the dean of the Harvard University Graduate School of Design and the Alexander and Victoria Wiley Professor of Design. He's been a part of a number of institutions, including dean at Cornell, and he was the chairman of the Architectural Association School of Architecture in London where he also studied architecture and undertook research on counterreformation urban history at the Universities of Essex and Cambridge. He has also taught at the University of Pennsylvania, the University of Cambridge, and the Frankfort Academy of Fine Arts.

As an esteemed member of the international architectural and urban design community, Mohsen is a trustee of the Van Alen Institute, serves on the steering committee of the Aga Khan Award for Architecture. He's chaired the North American Jury of the Wholesome Foundation Awards for Sustainable Construction and has served on the Design Committee of the London Development Agency. He has also served as a jury member for the RIBA Gold Medal and Annie Spink Award and the Advisory Committee on Campus Planning of the Asian University for Women. And as we heard earlier today, he introduced Ricky to his wife somewhere along the lines in that amazing history.

Mohsen's talk today is entitled "Ecological Urbanism" and it's also the title of a book that he recently published. I would describe the book as being in part a set of radical interdisciplinary perspectives, and as a member of the Sam Fox School of Visual Arts I would also call it a treatise on the art of urbanism. Nearly 15 years ago -- now, Rem Koolhaas in his project for this city which originated at Harvard in one of the early publications had an equation and Valente was talking about an amazing equation of one car equals two trees. This equation was world equals city. And while it's not on the back of Mohsen's book, I think it could say for his book city equals nature. And so it was wonderful to hear that come up in our previous conversation.

It would of course be a double meaning in a sense city equals nature. It's not only our nature but the nature of Thoreau, which is the interrelationship of ourselves and our environment, and as we've heard over and over again today, as importantly, each other. And it reminds us that that same openness that allows us to be sensitive to the inequities of the world allows us to perceive its beauties. And for that I think Mohsen's book adds a fourth edition to the triple bottom-line which is the nurturing of our imaginations. So please join me in welcoming Mohsen to the podium.

(Applause)

MR. MOSTAFAVI: Good afternoon. Many thanks to Dean Lindsey, to all our friends from WASHU, Peter, Carmen, thanks to all of you. Thanks to Ricky for the presentation this morning and for all the great things that have been said.

Now, you know, this is the part of the afternoon when a lot of things have been said, the layers of kind of ideas are building on top of each other, and I think what I would like to do is really to focus more specifically on the role of the academy. What is the responsibility of the academy in this project of urbanization, especially because of this particular collaboration between the university and Brookings?

This morning President Talbott spoke of the nature of the collaboration between Brookings and WASHU by speaking of the arts, the beauty, the role of design more broadly, and really the connection of Brookings to the investigation of this fear of social sciences more broadly and then saying that urban design is the link. And I think Alex has now made another reference and I think in a very helpful way has explained what urban design is. In the second part of his comments he said that urban design -- well, in the first part he said the role of urban design is a set of tools. In the second part he spoke of urban design as a discipline.

Now, many people would not agree that urban design is a discipline. In my part of the world people would say that urban design, like the concept of tools, is really about a certain set of practices. It's what you do. It's this combination of things that was mentioned. Now, Dean Lindsey also mentioned that there was the celebration of the 50th anniversary of the urban design program at WASHU. We had our 50th anniversary of the urban design program at the GSD about two years ago, so I guess we beat WASHU by about two years. But there have always been a lot of connections between the GSD and WASHU. But the reason that I raise this is because it's only 52

years ago that the very first program in urban design in the nature was established at Harvard. So actually, urban design as an academic program of study is relatively young.

So what did people do before then -- before 52 years ago? Obviously, they made cities. We know of many beautiful examples of planned cities, of organized cities, and so on. But it is only 52 years ago that we really had the notion of we need to study something which has to do with the design of cities. I happen to be fortunate to also have a department which is called the Department of Urban Planning and Design, and this department contains a program in planning and a program in urban design, and together they make the Department of Urban Planning and Design.

Planning in the context of the United States in some ways shares many of the ideas, the ethos, if you like, that the Brookings has. It deals with questions of policy. It's rooted in the social sciences. And in the United States we actually have very few planning programs that are also connected with design. They are fundamentally rooted in policy programs. They are not project-based. Therefore, it's very important for us that the planning program at the GSD is indeed a project-based planning program. We design and deal with the imagining or the construction of cities.

But what does it mean when you talk also about the putting together or the proximity of planning and urban design? In a way, the urban design that was created by Jose Luis Sert, who was then the dean of the Graduate School of Design, was precisely this idea of a program. It was not a department and it was seen as something that a lot of architects and others did in terms of addressing the city precisely after the Second World War when really the question of the reconstruction of the city became a critical part of what was needed from the academy.

So today I think during many of the conversations there have been a lot of suggestions of what we have to do to our cities -- to existing cities, but also in terms of

how we begin to think about new cities. But I think from the perspective of the academy, since we are not an NGO, since we don't actually hold government positions -- we try to have impact but nevertheless, our fundamental role is really in terms of the teaching, the construction of knowledge, the research, and the dissemination of that knowledge from within the academy. We have the responsibility also to ask the question what is urban design today? What is the relationship of urban design to planning? And how do you actually, within the context of the academy, construct the circumstances for people who are studying to be able to imagine and think about different kinds of cities? In other words, we have the responsibility not to reduce our tasks, our aspirations to something which is really a certain set of technocratic practices related to the city even though that's a very, very important thing, but the question of under what kind of circumstances you can imagine other possibilities becomes an important issue for the academy to issue.

This morning, when Ricky was showing the transformation of the area around Thames Valley, which then became the Olympic Park, well, because we could see many years ago that there was nothing on that site and it's really incredible to see the transformations that have happened in such a short period of time, I completely agree with this idea that, in fact, these things have been important, they have been radical, and they have actually produced very much many kind of livable environments. But the point is that the example of the kind of design that happens cannot be implemented by the bodies in some way, cannot be forced by the bodies who commission the consultants, the architects, the practitioners who build these places. Those practices already exist within sort of the firms that carry out and do this kind of work.

And when we see the final results, it's important to note that the outcome of these results is still very much rooted in certain traditions of modernist planning. In other words, the concept open space, of green, of residential buildings and things like

that, it's a very specific lineage of urban design that we are the inheritors of. So I guess what I'd like to do is to say that it's really critical for us to speak about the way in which we can actually, from the perspective of the academy, think about alternative possibilities, kind of counter projects or projects that advance, if you like, the research, the findings, the proposals of modernist architects and planners. And this project of ecological urbanism was in a way a way of addressing that issue. It's not just to try and say that cities in the future should be ecological or should be sustainable. That's to be taken for granted. But it's asking the question, "If we are going to think through the framework of ecological practices and think about cities, how does it act? How does it work as a catalyst in order for us to really imagine a different kind of city? Of course it's important for those cities to be more equitable. Of course it's important for those cities to have to utilize less energy and so on. But actually, is this city going to have a different environment? Is it going to have a different shape? Are the forms of buildings going to be different?

So I think opening up that question, especially in the context of design education, and especially in the context of contemporary research universities, it then opens up the possibilities for collaboration, for working across the different disciplines, which actually transcend the design discipline. And really, that's like the synopsis if the next, whatever, 15 or 20 minutes that I have left.

The project of ecological urbanism, as was said, on one level has roots in other traditions. One, which has been in a sense mentioned briefly, is that at the end of the 16th century we do find that cities like Rome are constructing new ideas in terms of how to create an urban fabric, and that urban fabric is based on the idea of the connection of the different churches to each other to create, if you like, a kind of topography of Catholicism. But that topography of Catholicism, that notion of the

churches as nodes and the connections as streets is something that's deeply rooted in landscaped tradition. It's something that the person who was actually doing that was developing a garden and was really exploring the idea of how you make a garden with points, with obelisques, with nodal points, and the allies that connected the parts of the park therefore become the examples for how you make a city. Literally at the end of the 16th century there was an idea of in some ways duplicating the city as vision of a garden. As a vision of landscape.

And we see the continuity of that much more explicitly when we look at places like the tradition of French landscaped parks and see the correlations, for example, between Versailles and Paris and the fact that on the one hand Paris is a city which is based on the notion of the utilization of military techniques but at the same time it's really the idea of a city that's based on a replication of landscape, of ideas that come from the formal French landscape tradition.

So this correlation between landscape and urbanization has been in play basically since the latter part of the 16th century. And I think a group of people, including myself for the last 10 or 15 years, have worked on a variety of different projects under the rubric of landscape urbanism. Landscape urbanism has been used to mean quite a few things, but one of the things in terms of the project that I was working on was really what is it that we can learn from the techniques and from the development of landscape as part of a series of methods for developing cities. It didn't mean that cities are parks; it meant that there are actually certain things that happened, for example, in the development of the agricultural territory in the making of landscapes as technique that could be used for making cities.

This is a much longer conversation and something that could be the topic of a lecture by itself. But I just want to say that I felt that this particular project, in terms of

the contemporary situation, has certain limitations because it focuses on tools -- focuses on how, techniques, and so on, which are absolutely necessary. I felt that the project of ecological urbanism really needs to be a broader project. It needs to be one that really addresses the question of the interrelationship between ecology and urbanization at a multiplicity of levels -- economic, cultural, political, artistic, and so on. And therefore, some of these words that you see on the screen address, if you like, the tools or the modes of thinking or the sensibilities of ecological urbanism, which are the themes like the condition or the topic of anticipation, manners of collaboration, senses, the concepts of curation, productions of all sorts, interaction, mobilization, mobility, measurement of things, adaptation, incubation. And these became the titles, the thematics, the topics of investigation for the project.

But many of these things also have to *de facto* refer to finding new ways of creating environments that produce, if you like, new kinds of terrains, new kinds of landscapes because when we also discuss the concept of ecological urbanization, like the issue of endless city, it's really not just about cities as bounded cities; it's really about thinking about a territory that transcends the limitations or the limits of the city. It simultaneously incorporates the rural with the urban and so on. So part of the project of ecological urbanism is really the project of creating a new aesthetic practice, new modes of imagining. And here, for example, we have the case of salt fields where these salt fields are not designed as a landscape; they're actually a productive landscape without any kind of predetermined, if you like, aesthetic value. But the actual construction of these salt fields produces an aesthetic condition. And so one of the thing that I'm suggesting is that we actually need to try and create situations in our cities where what has been at times thought of only in terms of functionality, only in terms of usefulness, now begins to have other byproducts which invariably must be seen as being

pleasurable, aesthetic, and I think other people have made this comment earlier today.

But this issue is not just to do with the territory. We're also building bigger and bigger buildings, where these buildings, for example, devoted to leisure and pleasure are incorporating what normally would have been -- on the outside would have been exterior beaches, pleasure grounds, and so on and so forth. And actually, internalizing that into what we might call the landscapes of the interior.

So hold that thought about the idea of the open field and the idea of the interior that gets sort of big enough for it to be seen as landscape and then, you know, we are facing a situation where this whole issue of resources, infrastructure, the waste that we produce becomes such an incredible part of our everyday life and says an enormous amount about us, about ourselves in terms of the conditions, the culture that we have through the production of garbage. The garbage of a culture is very much sort of indicative of the values, if you like, of that.

So we can see the scale of the production of waste or garbage in a place like New York City, but at the same time we can see that these questions of resources, and I mentioned the word "infrastructure" can maybe have other possibilities. The manner in which the salt that is used for snow removal becomes part and parcel of a curatorial practice is no longer just the function of actually using the salt in order to deal with the deicing or cleaning of the street but actually the degree to which something like the orchestration of where the salt comes from, where it's stored, how it's taken to many places, and so on and so forth actually leaves many traces that can themselves be part of, if you like, an artistic or aesthetic practice.

And therefore, it's not surprising to see in the case of somewhere like Paris with this particular project, which is the precursor to the highline, it's a project called the Promenade plantée, which actually used an existing disused railway line which

moves through the fabric of the city as a continuous datum but the topography of the city changes as indeed it does with the highline to some degree. But here the shifts in terms of the changes in the sectional outline of the urban topography is quite dramatic and therefore, the Promenade plantée is at one point many meters, many levels above ground next to an adjacent window of an apartment building and at another point is on the ground floor of a park or a landscape. But the interesting thing about the Promenade plantée, like the highline, is precisely the fact that an element of infrastructure is also an element of the park and an element of urban pleasure.

The other issue that I think is probably important to put on the table is that when we talk about urban design, in many ways a lot of the time we're talking about the notion of middle scale, if you like. Urban design relies on one level on these concepts of processes and practices. On the other hand, urban design also relies on recollection. Recollection in the sense that urban design -- if you look at urban design plans, they operate at a middle scale because what they do is they're negotiating the space between the city and its architecture. This architecture is something that by the urban designer to some degree -- and this may be a controversial thing to say -- but to some degree is already given. It's a sort of preexisting condition of architecture. It's, of course, not a design. It's not quite clear that that building will be precisely the building that has been placed on the map, on the site plan, but nevertheless, it is based on the designers' somehow reflections or recollections of a certain set of buildings that they might wish to have as part of that master plan. Therefore, this middle scale suggests that urban design on one level always deals with the preexisting architecture. Always deals with an architecture that has been, and in that sense there is always a certain degree of nostalgia involved in these operations of urban design.

So if we want to make urban design radically different, we really also

have to address the question of scale or differentiation within urban design. The Japanese firm, Atilia Bawa has worked on a variety of projects which could be seen as kind of micro urbanism, really dealing with the concepts of small scale elements of urban infrastructure. They have equally dealt with the rethinking or the reconfiguration of the Japanese house where the section of the house, which by U.S. standards, are minute, become extremely dense and extremely rich in terms of what they actually offer on the interior. Unfortunately, because of time, we can't get into the details of this, but take my word that this idea of scale of differentiation, of really dealing with both small scale things and large scale terrains, of territories, in order to redefine the middle scale is something that is really imperative for us to think about. And I could sort of relate this also, for example, to the Mercedes-Benz building or to the way in which when we talk about the question of ecological urbanism we're also really thinking at a much more sensory, bodily level of city architecture and the interior where the whole discussion of architecture shifts from the recollection of what we see as images, the legibility, the imageability of the city. And I'm emphasizing this because in the U.S. we have inherited now, after the modern traditions, a different tradition, if you like, which is the tradition of new urbanism, which is fundamentally based on this concept of imageability or legibility of the urban.

Therefore, I think it's important or interesting to really think about the question of thermodynamics of the thermal, of the environmental, also as something which has more to do with our tactile sensory qualities of our bodies and therefore we need to really spend more time thinking about interiors and the small scale as much as we think about the large scale if we're thinking about ecological urbanization, if we're thinking about sustainable cities. And this is obviously something that led to, for example, this question of what about the inside? What do we think about the inside? We don't spend anything like enough time as architects really worrying about or thinking

about interiors even though many architects who within the academy are designing object buildings and large scale buildings actually end up doing or spending a large part of their careers doing interiors.

Therefore, I think there is something that we can learn from certain traditions, for example, again, of Japanese architectural practice. Here is the work of the Japanese architect Shinohara with some of his projects from the '60s and '70s that really were focused on the quality, the character of the interior. It's not so much about just the design of the house as it is about the relationship between that design and really the kind of life that happens inside those houses.

Anyone who has seen the work of the Japanese film director, Yasujiro Ozu -- Ozu was a director that made some beautiful, beautiful films. He focused very much on this idea of the filming, the idea of the interior, the inside as a setting. So these are some of the drawings that he was making for a film where you can see, for example, always this relationship between the figure, the room outside, the concept of threshold, the relationship of figures to each other, and so on and so forth. You might think maybe there is no -- what is the relevance of cinema? What is the relevance of film? What is the relevance of Ozu to architecture? But I'd like to argue that, in fact, in such images you immediately begin to implicate the body. You begin to implicate the user, the person who is actually benefitting or participating in some sense from the life, and therefore, the kind of spaces or the quality of life that we have in our cities must be part of this project of how the urban designer or the architect is imagining the specificity of life that takes place in our cities.

So more examples of how the Japanese are actually focusing in some ways, there are many architects all over the world who could be, but I'm just showing these images precisely to point out again the question of the necessity of scale or

variation as part of the project of innovative metropolis, if you like. Despite all the enthusiasm, interest, the work that has happened on, for example, urban buildings, today we still really can't speak of too many significant examples of buildings that have combined the high-rise with, for example, productive landscapes with green in a way that is functioning. So this is an incredible challenge. If we are going to have really dense urban environments, how do we begin to also bring that aspect of the productive landscape, if you like, inside within the building?

There is more and more work that is being done on how we can utilize energy from various sources, and companies like Ove Arup and others have really started looking at this notion of the green façade to mean literally a façade made of greens. And Patrick Blanc uses the concept of the green in a much more sort of aesthetic fashion rather than in terms of the performative functional way in which Arup did. But actually, these kinds of topics and these sorts of issues of the interrelationship become relevant in terms of the manner of making buildings or making future cities.

In the 1970s there was an incredibly exciting French architect called Johan Odee. And Johan Odee built a series of very dense apartment building in Paris and in the south of France. This is a close-up of a building which is in a suburb of Paris called Évry. And in Évry, which is really a kind of very much working-class part of the city, he built this building where one of the aspirations of the project was to maximize the amount of outdoor space that each apartment building had. In other words, he didn't want to do a modernist apartment building where everyone got a notional balcony. He literally wanted to create a diversity of outdoor spaces for the citizens, each one of them different. It's quite a difficult task to realize but if you visit this place today you are absolutely amazed by the incredible quality of these different landscapes or gardens, literally private gardens that people have on their fifth, sixth, seventh floor apartment

building. Therefore, this is also a project of creating a different kind of building which is really utilizing landscape in a much more artificial way if we can put it like this. It's not just about buildings in nature but it's actually about the artificial incorporation of nature into the making of buildings.

And I think earlier this idea of the balance with certain aspects of landscape came about and so here are, for example, drawings done by Anuradha Mathur and Dilip da Cunha that look at the floods, for example, the monsoon in Mumbai, and really the idea of the creation of new forms of spaces or landscapes that are in balance with that. These kinds of ideas, of course, in terms of going back to the categories of the ecological urbanism, connect to questions of mobility. And since we've heard from Ricky and others about that I can pass through this, but obviously, we need to think about these alternative modes of mobility. These are some examples that the late Bill Mitchell, who was a colleague of mine at Harvard and then later on at MIT, worked with some of his students in terms of creating new kinds of relationships between the automobile and urban infrastructure.

And so constantly we are shifting from the small scale of things, scale of places, to the scale of territory and the scale of the region. Richard Forman, the ecologist who a professor in the Department of Landscape Architecture, has really done a lot of work on this idea of the study of regions. And really, not to see cities solely in terms of their own defined areas but really in terms of their connection to the bigger territory. Other colleagues have really looked at the whole concept of sea level rises and the way, the manner in which we will need to think about this issue of Red Hook that Alex brought up more broadly across the world where many, many, many new situations for building cities will actually need to be in relation to coastal areas. And therefore, we need a different kind of architecture, a different kind of urban environment that is much more

malleable and porous and works with this question of the movement of water.

Another set of interesting practices in terms of the multiple scales from the sort of invisible intangible to the physical intangible is really exemplified by the work of the Italian radical architect and urbanist, Andrea Branzi. Branzi, working with a group of colleagues since the '60s, has pioneered a great number of ideas that really look at the possibilities of contemporary culture and technology in terms of the formation of new kinds of cities. For example, the role of network culture, the use of mobile phones, the impact of technology on urban areas, the idea of the agricultural territory through a series of projects which really look at the interface between agriculture and urbanization, which are also of really significant use when we think about cities like Detroit where we have the density of the urban becoming more and more dedensified and actually finding more open spaces. How do you begin to bring the combination of agriculture and urbanization together? And of course, many of these ideas are rooted in an important project which is called "The nonstop city from the 1960s."

So my point is that we actually need to find new kinds of ideas, new sort of possibilities to think about the manner in which we think about the city and the making of the city. Some of our students recently have been developing these ideas through a series of projects called "Over Ubanism," where the relationship between the urban map or the site plan and landscaping becomes so dense that you actually think about not just the making of buildings in relation to landscape but actually a fusion of buildings and landscapes just in order to be able to find new ways of thinking about the relationship between density and the orifice of nature.

These ideas need to go beyond the scale and study of the interior to really the study of the surfaces of buildings, their qualities. This is a project that was done in terms of the study of the building skin and the sort of responsive building skin.

And really, the question of the leisure and the pleasure is something that is part of this project.

Because of time I'm just going to run through these slides without explaining too much. If we want during -- if there's any time afterwards we can discuss any of them any of them, but basically this is to talk about the senses, the smell of the city, the visuality of the city, the role of music, the question of how we think about the city and its energy in different ways, the role of monuments or different kinds of monuments in our cities, the concepts of informal communities, and finally, really what comes afterwards, which we don't have time to go into. These were some examples to really talk more specifically about the U.S. case of the connection between New York City and New Jersey. Many of you might recognize this as the beginning of the Sopranos and I would love to discuss that with you why I have these images of the Sopranos, but maybe we can discuss that later.

And basically, my point is that after the discussion of ecological urbanism, this issue of the life that is lived in the cities becomes part and parcel of our material, of our project, of the way in which we think about the future of our cities through that understanding of life. Here are some beautiful photographs by Michael Wolf of Chicago, which is part of that conversation, and the city of Cardiff, which has a very different kind of Saturday night outlook, which we can talk about later. And the issue of politics.

Finally, these are just some images to really emphasize the relationship between the academy and the concept of dissemination of information, the ecological urbanism. Exhibition has gone, for example, here is how the people in Kuwait dealt with this. They took the images of the book and they enlarged it and they created their own sort of book. And these are also the e-books and an app of this and, of course, the

creation of other themes within the academy that built on these issues in order to create a kind of culture of addressing the urban. And maybe I will just stop here.

Thank you.

(Applause)

MR. LINDSEY: I think we're at 3:15, which is our scheduled time to conclude in this room. There may well have been questions raised by all of the definitions, so to speak, suggested in Dean Mostafavi's presentation. Could I suggest this -- hold onto those questions. We're going to shift across the hall, moving through I think some beverages and things, and then reconvene in two or three minutes across the hall where we'll have a moderated discussion with Dean Mostafavi, with Professor Burdett, with John Hoal of our Urban Design Program, and Amy Liu from the Metropolitan Policy Program. So please join us just two minutes across the hall. Thank you.

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